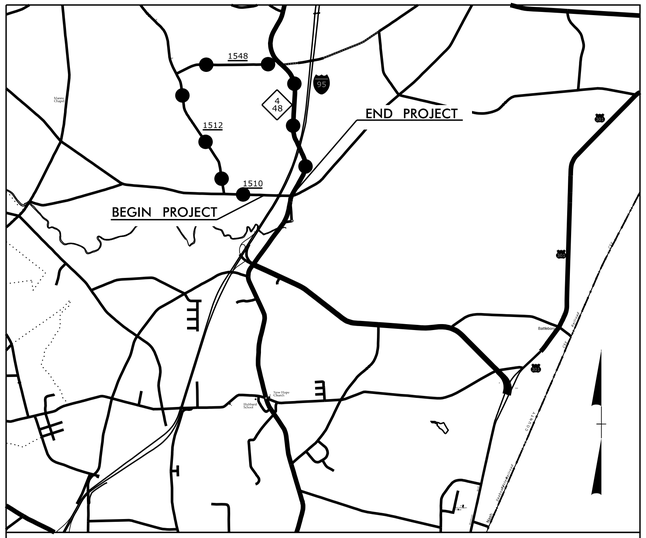
TIP PROJECT: BR-0039

CONTRACT: C204350



VICINITY MAP

OFF-SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

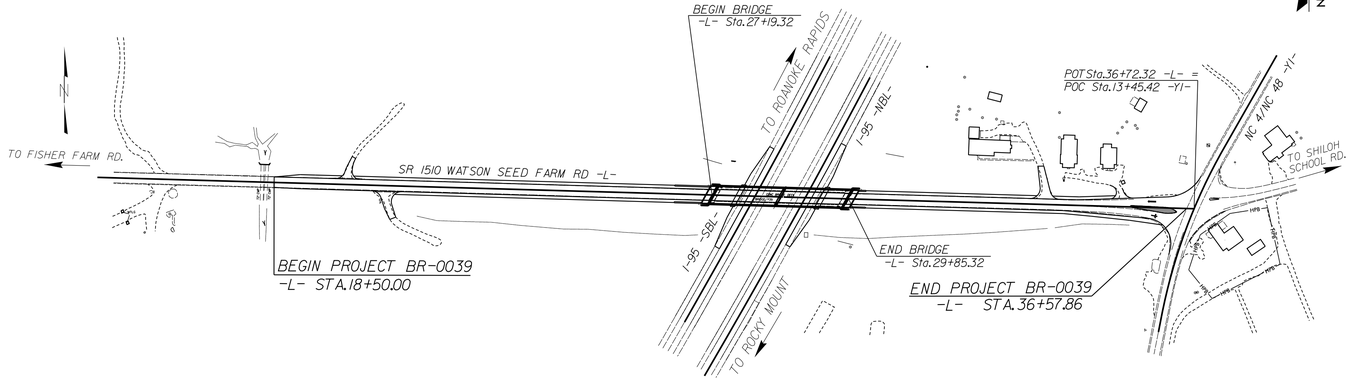
NASH COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	BR-0039		

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
49075.1.1		P.E.
49075.2.1		R/W
49075.3.2		CONST

LOCATION: BRIDGE NO. 630224 ON SR 1510 OVER I–95.

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE.



V&M Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796

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Atlanta, GA 770-627-3590
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL SEAL 042890 ENGINEER PATRICK R. GALLAGHER
Documents not considered final unless sealed
Patrick R. Gallagher
4/21/2022

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DESIGN DATA

ADT 2020 = 1,900
ADT 2040 = 2,000
K = 8%
D = 70%
T = 3%
V = 55 MPH
* TTST=1 % DUAL=2 %

FUNC CLASS =
MINOR COLLECTOR
SUBREGIONAL
TIER

PROJECT LENGTH

LENGTH ROADWAY PROJECT = 0.292 MI
LENGTH STRUCTURE PROJECT = 0.050 MI
TOTAL LENGTH OF PROJECT = 0.342 MI

NCDOT CONTACT: DAVID STUTTS, PE
PROJECT ENGINEER, PEF/PROGRAM MGT.

Prepared in the Office of:
VAUGHN & MELTON
1318-F PATTON AVE.
ASHEVILLE NC, 28806
FOR THE NORTH CAROLINA DIVISION OF HIGHWAYS

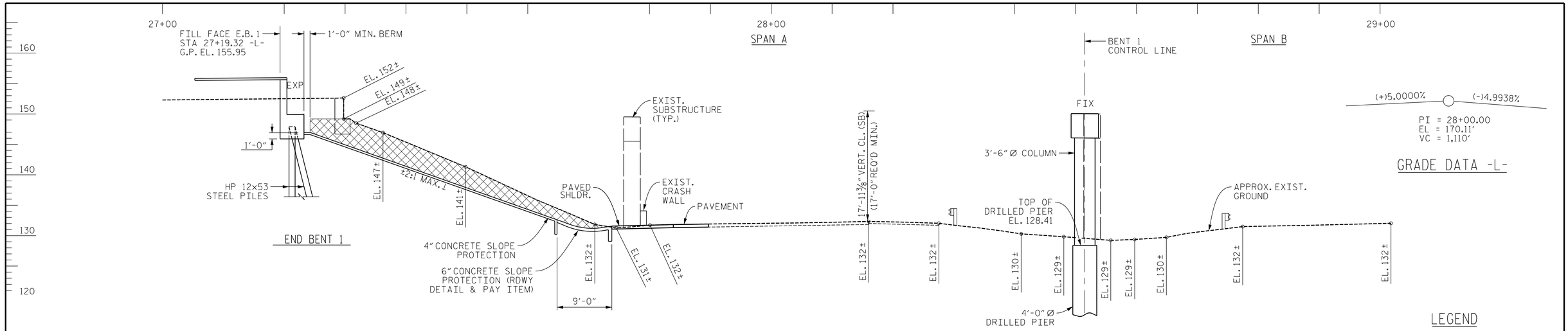
2018 STANDARD SPECIFICATIONS

LETTING DATE:
JUNE 15, 2021

PAUL GARRETT, PE
PROJECT ENGINEER

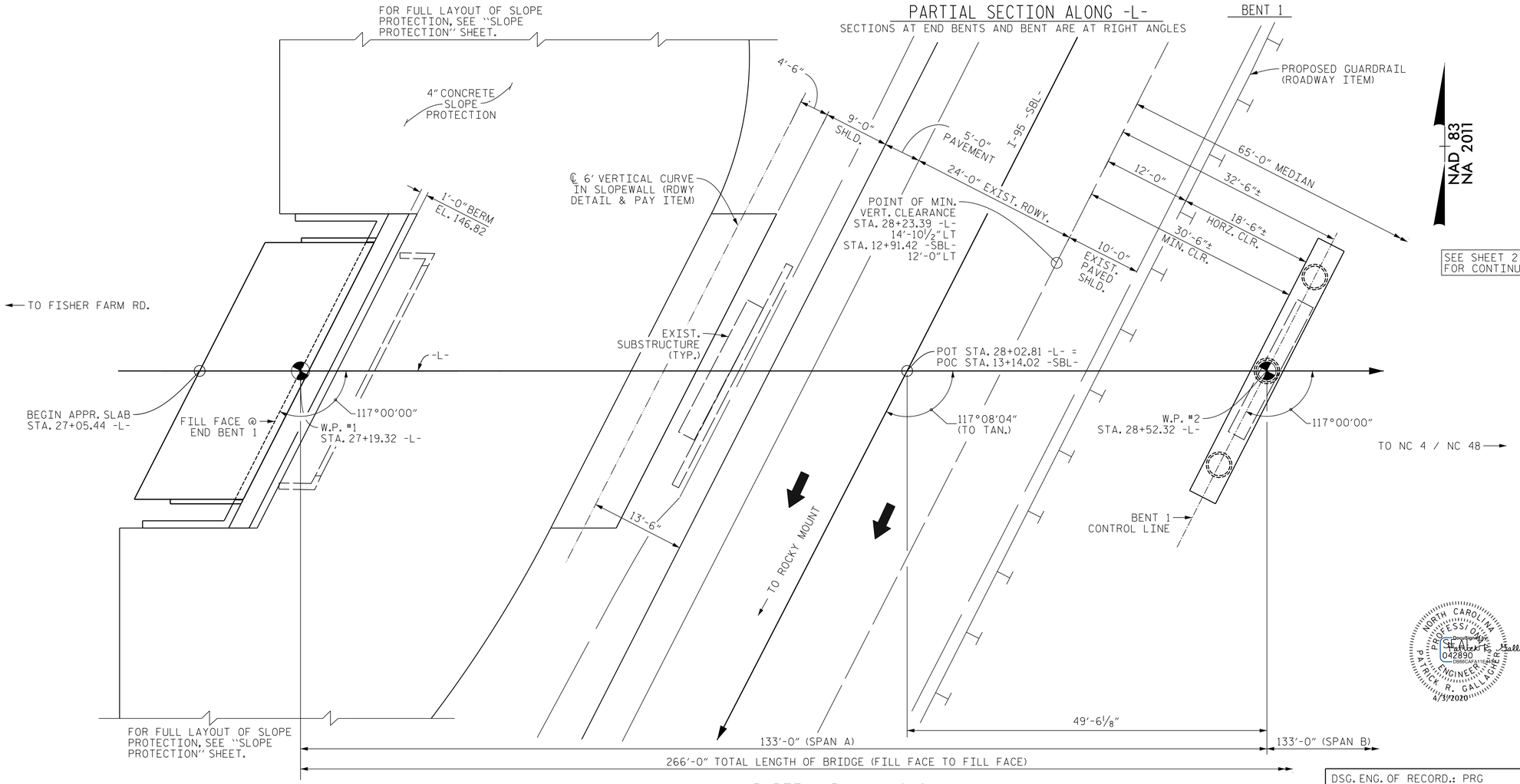
PATRICK R. GALLAGHER, PE
PROJECT DESIGN ENGINEER

STATE OF NORTH CAROLINA · DEPARTMENT OF TRANSPORTATION ·



PARTIAL SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE AT RIGHT ANGLES



SEE SHEET 2 OF 4
FOR CONTINUATION

NAD 83
NA 2011

PI STA. 12+67.01
△ = 1° 52' 31.5" (RT)
D = 0° 22' 00.0"
L = 511.48'
T = 255.76'
R = 15,626.12'

HORIZONTAL CURVE DATA
SBL I-95

NOTE:
END BENTS AND BENT ARE PARALLEL

PARTIAL PLAN ALONG -L-
PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

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Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 1 OF 4 REPLACES BRIDGE #224

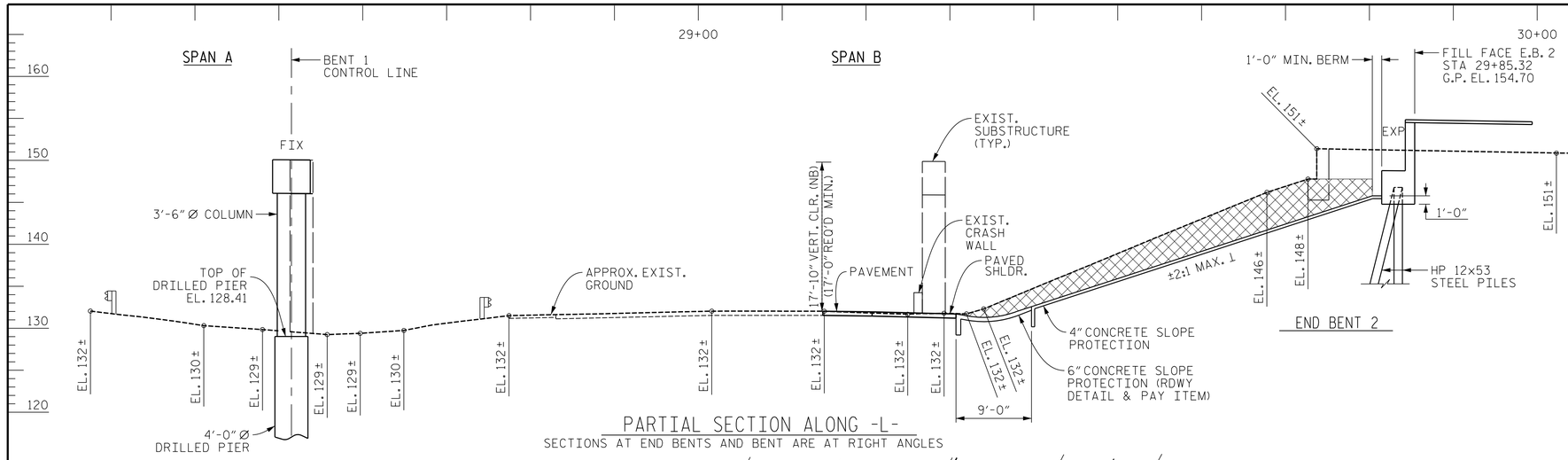
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Signature: Patrick R. Gallagher
Date: 4/3/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON SR 1510
OVER I-95 BETWEEN
FISHER FARM RD.
AND NC 4 / NC 48

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-01
1			3			TOTAL SHEETS
2			4			31

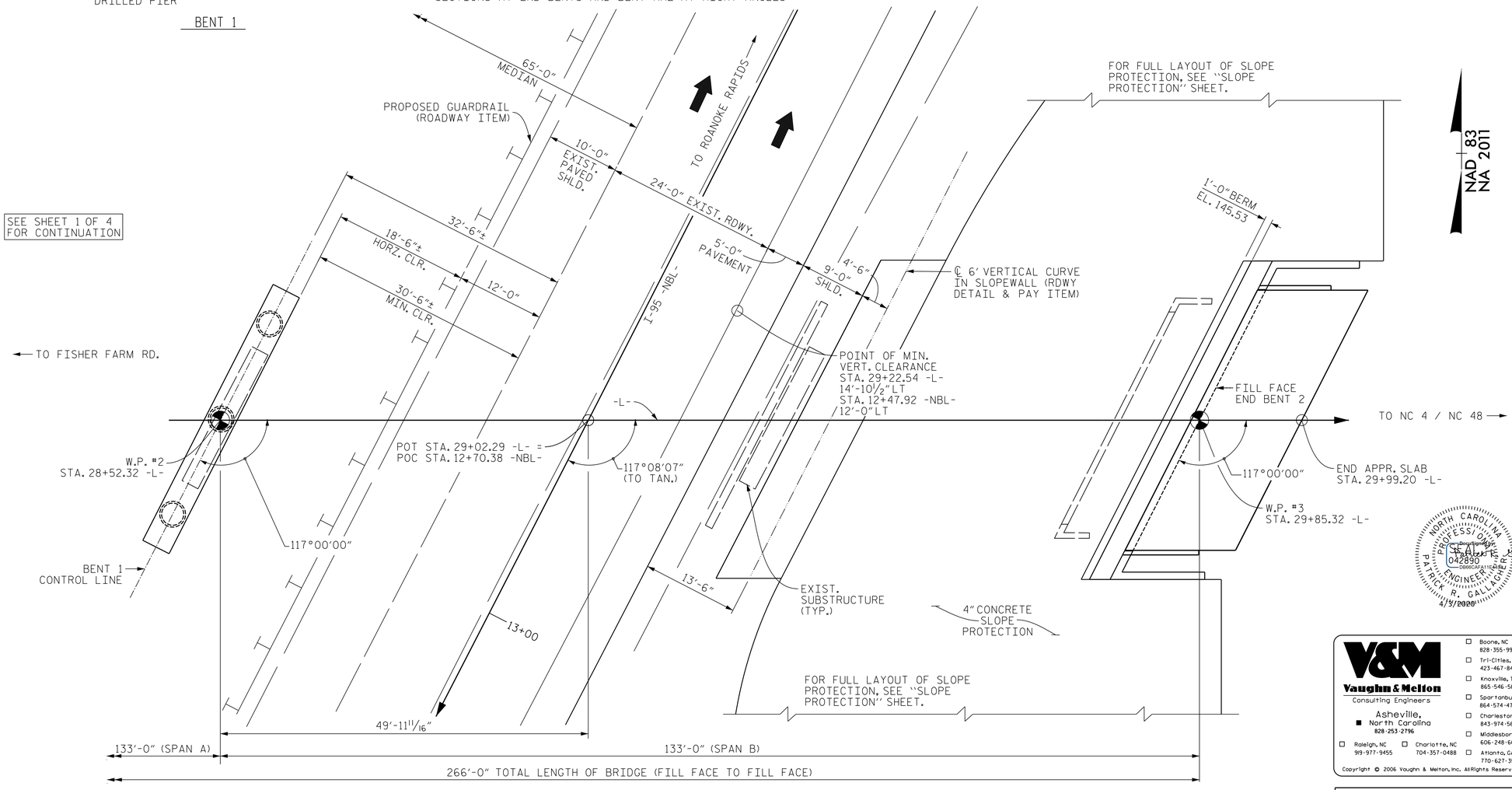
V & M PROJECT NO.: 31748-42



PARTIAL SECTION ALONG -L-

SECTIONS AT END BENTS AND BENT ARE AT RIGHT ANGLES

BENT 1



PARTIAL PLAN ALONG -L-

PILES NOT SHOWN IN PLAN VIEW FOR CLARITY

NOTE:
END BENTS AND BENT ARE PARALLEL

(+)5.0000% (-)4.9938%

PI = 28+00.00
EL = 170.11'
VC = 1,110'

GRADE DATA -L-

LEGEND

UNCLASSIFIED STRUCTURE EXCAVATION (SEE NOTES)

PI STA. 13+39.98
△ = 2°08'11.0" (RT)
D = 0°22' 00.0"
L = 582.65'
T = 291.36'
R = 15,626.12'

HORIZONTAL CURVE DATA

NBL I-95

NAD 83
NA 2011

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
DocuSigned by: 4/3/2020

SHEET 2 OF 4

V&M Vaughn & Melton Consulting Engineers
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
BRIDGE ON SR 1510
OVER I-95 BETWEEN
FISHER FARM RD.
AND NC 4 / NC 48

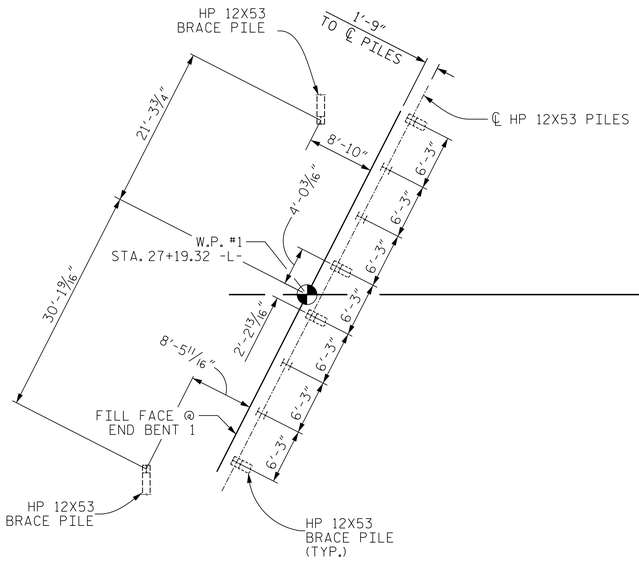
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

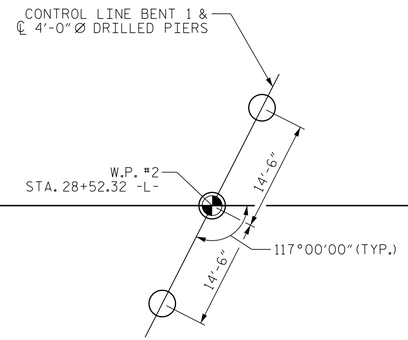
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-02
TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42

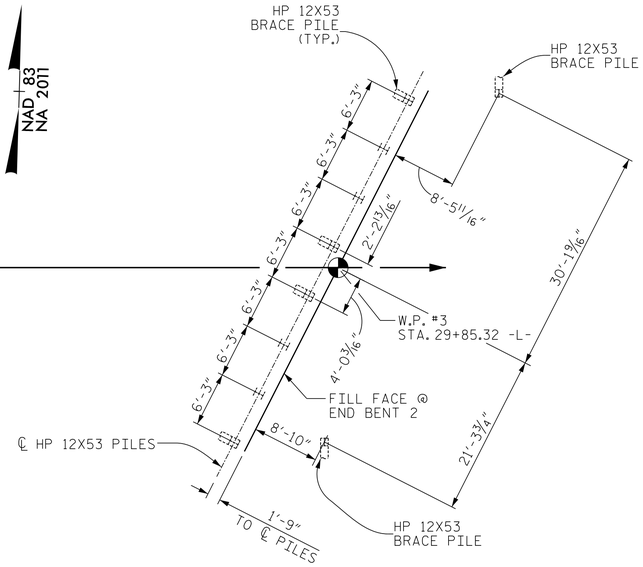


END BENT 1



BENT 1

NAD 83
NA 2011



END BENT 2

FOUNDATION LAYOUT

DIMENSIONS LOCATING PILES ARE SHOWN TO THE ℄ OF PILES
BRACE PILES BATTERED 3:12

FOUNDATION NOTES:

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO. 1 AND END BENT NO. 2 ARE DESIGNED FOR FACTORED RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT END BENT NO. 1 AND END BENT NO. 2 TO A REQUIRED DRIVING RESISTANCE OF 185 TONS PER PILE.

OBSERVE A ONE MONTH WAITING PERIOD AFTER CONSTRUCTING THE EMBANKMENT, END BENT AND REINFORCED BRIDGE APPROACH FILL, IF APPLICABLE, BEFORE BEGINNING APPROACH SLAB CONSTRUCTION AT END BENT NO. 1 AND END BENT NO. 2. FOR BRIDGE WAITING PERIODS, SEE ROADWAY PLANS AND SECTION 235 OF THE STANDARD SPECIFICATIONS.

FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

INSTALL DRILLED PIERS AT BENT NO. 1 TO A TIP ELEVATION NO HIGHER THAN 94 FT (LT, CT) AND 95 FT (RT) WITH THE REQUIRED TIP RESISTANCE.

DRILLED PIERS AT BENT 1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 660 TONS PER PIER. CHECK FIELD CONDITIONS FOR THE REQUIRED TIP RESISTANCE OF 90 TSF.

DO NOT USE SLURRY CONSTRUCTION FOR DRILLED PIERS AT BENT NO. 1.

SID INSPECTIONS MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS. FOR SID INSPECTIONS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

CSL TUBES ARE REQUIRED AND CSL TESTING MAY BE REQUIRED FOR DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR CSL TESTING. FOR CSL TESTING, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

V & M PROJECT NO.: 31748-42

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

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DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 3 OF 4

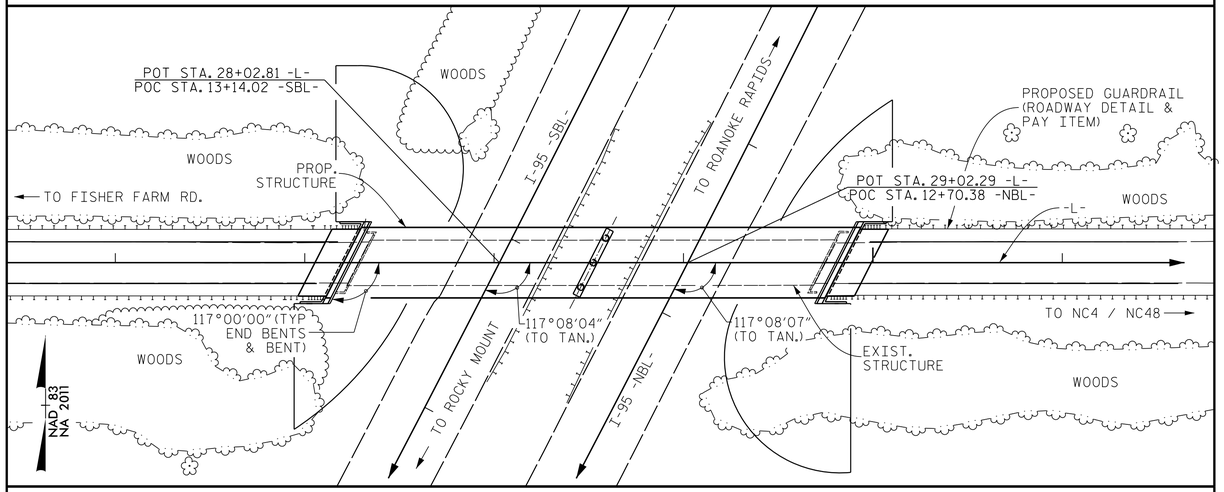
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER I-95
ON SR 1510 BETWEEN
FISHER FARM ROAD AND NC 4 / NC 48

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-03
1			3			TOTAL SHEETS
2			4			31

BM #2: BENCH NAIL SET IN BASE OF 36" OAK; BL STA 37+03.00; 6' RT; ELEV. 131.42; N = 848291, E = 2351537



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

GENERAL NOTES

ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE STANDARD SHEET SN.

REMOVABLE FORMS MAY BE USED IN LIEU OF METAL STAY-IN-PLACE FORMS IN ACCORDANCE WITH ARTICLE 420-3 OF THE STANDARD SPECIFICATIONS.

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR SYSTEM 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE AND PROTECTION OF TRAFFIC BENEATH PROPOSED STRUCTURE, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

THE EXISTING STRUCTURE CONSISTING OF A REINFORCED CONCRETE FLOOR ON I-BEAMS AT 7'-0" CENTERS IN 4 SPANS OF 48'-9", 75'-9", 75'-9", AND 46'-3", WITH END BENTS OF CONCRETE CAP ON PRECAST PRESTRESSED CONCRETE PILES AND INTERIOR BENTS OF REINFORCED CONCRETE POST AND BEAM ON PRECAST PRESTRESSED CONCRETE PILES, WITH A CLEAR ROADWAY WIDTH OF 39'-0" (SB & NB), AND LOCATED AT THE SITE OF PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT. FOR REMOVAL OF EXISTING STRUCTURE, SEE SPECIAL PROVISIONS.

THE ELEVATIONS AND CLEARANCES SHOWN ON THE PLANS AT THE POINT OF MINIMUM VERTICAL CLEARANCES ARE FROM THE BEST INFORMATION AVAILABLE. PRIOR TO BEGINNING CONSTRUCTION, VERIFY THE ELEVATION ON THE EXISTING PAVEMENT AND CHECK THE CLEARANCE, REPORT ANY VARIATIONS TO THE ENGINEER. ANY PLAN REVISIONS NECESSARY TO ACHIEVE THE REQUIRED MINIMUM VERTICAL CLEARANCE WILL BE PROVIDED BY THE DEPARTMENT.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT 28+02.81 -L-."

THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 65 FT LEFT AND 75 FT RIGHT OF CENTERLINE ROADWAY AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION. SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

TOTAL BILL OF MATERIAL

	REMOVAL OF EXISTING STRUCTURE	ASBESTOS ASSESSMENT	4'-0" Ø DRILLED PIERS IN SOIL	4'-0" Ø DRILLED PIERS NOT IN SOIL	SID INSPECTIONS	CSL TESTING	UNCLASSIFIED STRUCTURE EXCAVATION	REINFORCED CONCRETE DECK SLAB	GROOVING BRIDGE FLOORS	CLASS A CONCRETE	BRIDGE APPROACH SLABS
	LUMP SUM	LUMP SUM	LIN. FT.	LIN. FT.	EACH	EACH	LUMP SUM	SQ. FT.	SQ. FT.		LUMP SUM
SUPERSTRUCTURE								9822	9018		
END BENT NO.1										48.3	
BENT NO.1			86.2	16.0	1	1				47.6	
END BENT NO.2										48.6	
TOTAL	LUMP SUM	LUMP SUM	86.2	16.0	1	1	LUMP SUM	9822	9018	144.5	LUMP SUM

TOTAL BILL OF MATERIAL (CONT.)

	REINFORCING STEEL	SPIRAL COLUMN REINFORCING STEEL	APPROX. 462,000 LBS. STRUCTURAL STEEL	PILE DRIVING EQUIPMENT SETUP FOR HP12X53 STEEL PILES	HP 12 X 53 STEEL PILES		PILE REDRIVES	CONCRETE BARRIER RAIL	4" SLOPE PROTECTION	DISC BEARINGS	ELASTOMERIC BEARINGS	FOAM JOINT SEALS	FIBER OPTIC CONDUIT SYSTEM WITH HANGERS	JUNCTION BOX (OVERSIZE, HEAVY DUTY)
	LBS.	LBS.	LUMP SUM	EACH	NO.	LIN. FT.	EACH	LIN.FT.	SQ.YDS.	LUMP SUM	LUMP SUM	LUMP SUM	LIN. FT.	EACH
SUPERSTRUCTURE								527.33					294	2
END BENT 1	5356			10	10	420	5		713					
BENT 1	18543	3928												
END BENT 2	5345			10	10	370	5		705					
TOTAL	29244	3928	LUMP SUM	20	20	790	10	527.33	1418	LUMP SUM	LUMP SUM	LUMP SUM	294	2

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PROJECT NO. BR-0039

NASH COUNTY

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29+02.29 -L- = 12+70.38 -NBL-

SHEET 4 OF 4

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

FOR BRIDGE OVER I-95
ON SR 1510 BETWEEN
FISHER FARM ROAD AND NC 4 / NC 48

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-04
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR STEEL GIRDERS

LEVEL		VEHICLE	WEIGHT (W) (TONS)	CONTROLLING LOAD RATING (#)	MINIMUM RATING FACTORS (RF)	TONS = W x RF	STRENGTH I LIMIT STATE											SERVICE II LIMIT STATE						COMMENT NUMBER
								MOMENT					SHEAR						MOMENT						
							LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	LIVE-LOAD FACTORS (γ_{LL})	DISTRIBUTION FACTORS (DF)	RATING FACTOR	SPAN	GIRDER LOCATION	DISTANCE FROM LEFT END OF SPAN (ft)	
DESIGN LOAD RATING		HL-93 (INVENTORY)	N/A	1	1.09	--	1.75	0.857	1.09	B	EXT.	0.00	0.946	1.90	B	EXT.	0	1.30	0.857	2.04	B	EXT.	81.09	
		HL-93 (OPERATING)	N/A		1.41	--	1.35	0.857	1.41	B	EXT.	0.00	0.946	2.46	B	EXT.	0	1.00	0.857	2.65	B	EXT.	81.09	
		HS-20 (INVENTORY)	36.00	2	2.70	97.13	1.75	0.857	2.70	B	EXT.	81.09	0.946	3.01	B	EXT.	0	1.30	0.857	2.98	B	EXT.	81.09	
		HS-20 (OPERATING)	36.00		3.50	125.89	1.35	0.857	3.50	B	EXT.	81.09	0.946	3.90	B	EXT.	0	1.00	0.857	3.87	B	EXT.	81.09	
LEGAL LOAD RATING	SINGLE VEHICLE (SV)	SNSH	13.500		7.19	97.01	1.4	0.857	8.14	B	EXT.	81.09	1.057	9.64	B	INT.	0	1.30	0.857	7.19	B	EXT.	81.09	
		SNGARBS2	20.000		5.12	102.42	1.4	0.857	5.80	B	EXT.	81.09	1.057	6.62	B	INT.	0	1.30	0.857	5.12	B	EXT.	81.09	
		SNAGRIS2	22.000		4.76	104.65	1.4	0.857	5.39	B	EXT.	81.09	1.057	6.06	B	INT.	0	1.30	0.857	4.76	B	EXT.	81.09	
		SNCOTTS3	27.250		3.57	97.39	1.4	0.857	4.05	A	EXT.	51.04	1.057	4.79	B	INT.	0	1.30	0.857	3.57	A	EXT.	51.04	
		SNAGGRS4	34.925		2.91	101.53	1.4	0.857	3.30	A	EXT.	51.04	0.946	3.80	B	EXT.	0	1.30	0.857	2.91	A	EXT.	51.04	
		SNS5A	35.550		2.86	101.71	1.4	0.857	3.24	B	EXT.	81.09	0.946	3.75	B	EXT.	0	1.30	0.857	2.86	B	EXT.	81.09	
		SNS6A	39.950		2.60	103.83	1.4	0.857	2.95	B	EXT.	81.09	0.946	3.36	B	EXT.	0	1.30	0.857	2.60	B	EXT.	81.09	
		SNS7B	42.000		2.47	103.82	1.4	0.857	2.80	A	EXT.	51.04	0.946	3.23	B	EXT.	0	1.30	0.857	2.47	A	EXT.	51.04	
	TRUCK TRACTOR SEMI-TRAILER (TTST)	TNAGRIT3	33.000		3.17	104.58	1.4	0.857	3.59	A	EXT.	49.79	0.946	4.08	B	EXT.	0	1.30	0.857	3.17	A	EXT.	49.79	
		TNT4A	33.075		3.15	104.12	1.4	0.857	3.57	A	EXT.	49.79	0.946	4.03	B	EXT.	0	1.30	0.857	3.15	A	EXT.	49.79	
		TNT6A	41.600		2.55	106.25	1.4	0.857	2.90	A	EXT.	51.04	0.946	3.32	B	EXT.	0	1.30	0.857	2.55	A	EXT.	51.04	
		TNT7A	42.000		2.55	107.06	1.4	0.857	2.89	A	EXT.	49.79	0.946	3.23	B	EXT.	0	1.30	0.857	2.55	A	EXT.	49.79	
		TNT7B	42.000		2.57	108.07	1.4	0.857	2.92	A	EXT.	51.04	0.946	3.23	B	EXT.	0	1.30	0.857	2.57	A	EXT.	51.04	
		TNAGRIT4	43.000		2.49	106.98	1.4	0.857	2.82	B	EXT.	81.09	0.946	3.13	B	EXT.	0	1.30	0.857	2.49	B	EXT.	81.09	
		TNAGT5A	45.000		2.38	106.92	1.4	0.857	2.69	B	EXT.	81.09	0.946	3.04	B	EXT.	0	1.30	0.857	2.38	B	EXT.	81.09	
		TNAGT5B	45.000	3	2.35	105.75	1.4	0.857	2.66	B	EXT.	81.09	0.946	2.99	B	EXT.	0	1.30	0.857	2.35	B	EXT.	81.09	
FATIGUE		HL-93 (INVENTORY)	γ_{LL}=0.75																					

LOAD FACTORS:

DESIGN LOAD RATING FACTORS	LIMIT STATE	γ_{DC}	γ_{DW}
	STRENGTH I	1.25	1.50
	SERVICE II	1.00	1.00

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE II LIMIT STATES.

ALLOWABLE STRESS FOR SERVICE II LIMIT STATE ARE AS REQUIRED FOR DESIGN.

COMMENTS:

1.
2.
3.
4.

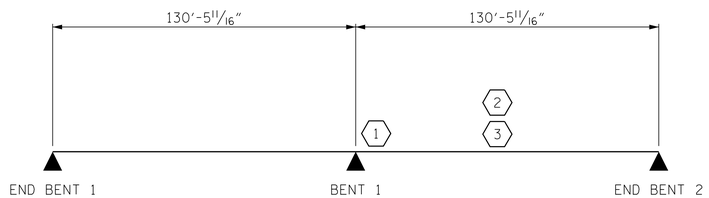
(#) CONTROLLING LOAD RATING

1. DESIGN LOAD RATING (HL-93) **
2. DESIGN LOAD RATING (HS-20) **
3. LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

INT.- INTERIOR GIRDER
EXT.- EXTERIOR LEFT GIRDER



LRFR SUMMARY

DIMENSIONS ARE SHOWN BEARING TO BEARING

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
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Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PROJECT NO. BR-0039
NASH COUNTY
STATION: 28+02.81 -L-=
13+14.02 -SBL-
29+02.29 -L-=
12+70.38 -NBL-

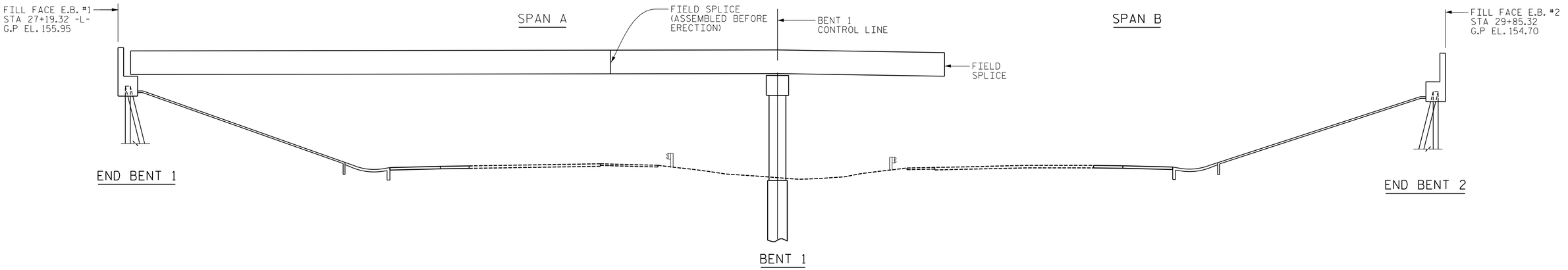
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD

LRFR SUMMARY FOR STEEL GIRDERS
(NON-INTERSTATE TRAFFIC)

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-05
1			3			TOTAL SHEETS
2			4			31

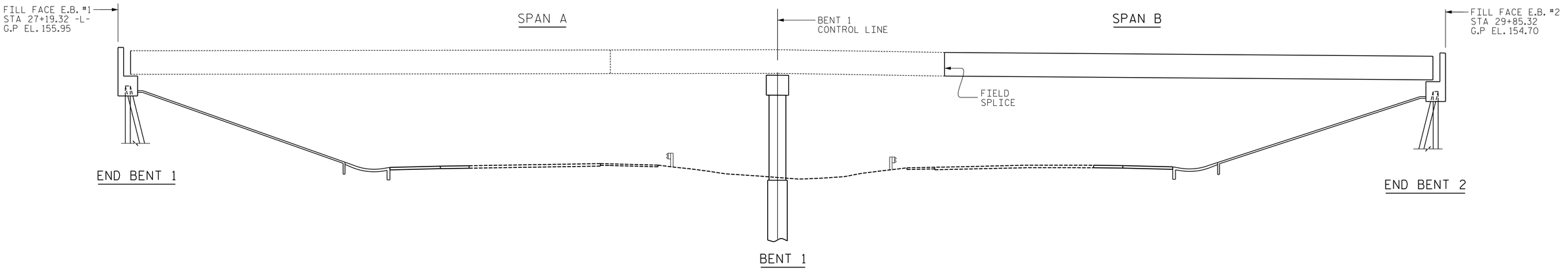
STD. NO. LRFR3

ASSEMBLED BY : AW		DATE : 8/2019
CHECKED BY : PRG		DATE : 12/2019
DRAWN BY : MAA 1/08	REV. 11/12/08RR	MAA/GM
CHECKED BY : GM/DI 2/08	REV. 10/1/11	MAA/GM
	REV. 12/17	MAA/THC



STAGE I GIRDER ERECTION

(SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES)



STAGE II GIRDER ERECTION

(SECTIONS AT BENT AND END BENTS ARE AT RIGHT ANGLES)

ERECTION NOTES

ERECT A MINIMUM OF TWO GIRDERS WITH ALL DIAPHRAGMS/CROSSFRAMES BETWEEN THE GIRDERS IN PLACE AND THE BOLTS TIGHTENED PRIOR TO RELEASING THE GIRDERS.

ERECT EACH SUBSEQUENT GIRDER WITH DIAPHRAGMS/CROSSFRAMES CONNECTING TO THE ADJACENT PREVIOUSLY ERECTED GIRDER AND TIGHTEN ALL BOLTS BEFORE RELEASING THE GIRDER.

THE STRUCTURAL STEEL SHALL BE SUPPORTED DURING ERECTION IN ITS CAMBERED POSITION.

THE CONTRACTOR MAY SUBMIT AN ALTERNATE ERECTION METHOD TO THE ENGINEER FOR REVIEW AND APPROVAL.

DURING THE GIRDER ERECTION PROCEDURE, THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY LATERAL BRACING AND OTHER MEANS OF SUPPORT, AS REQUIRED, AND TO ENSURE PLUMBNESS OF THE GIRDERS IN THE FINAL CONDITION.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
DN: cn=Patrick R. Gallagher, o=Vaughn & Melton, ou=Engineering, email=pgallagher@vaughnmelton.com, c=US
Date: 2020.04.13 15:41:47 -04'00'
4/13/2020

PROJECT NO. BR-0039

NASH COUNTY

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GIRDER ERECTION DETAILS

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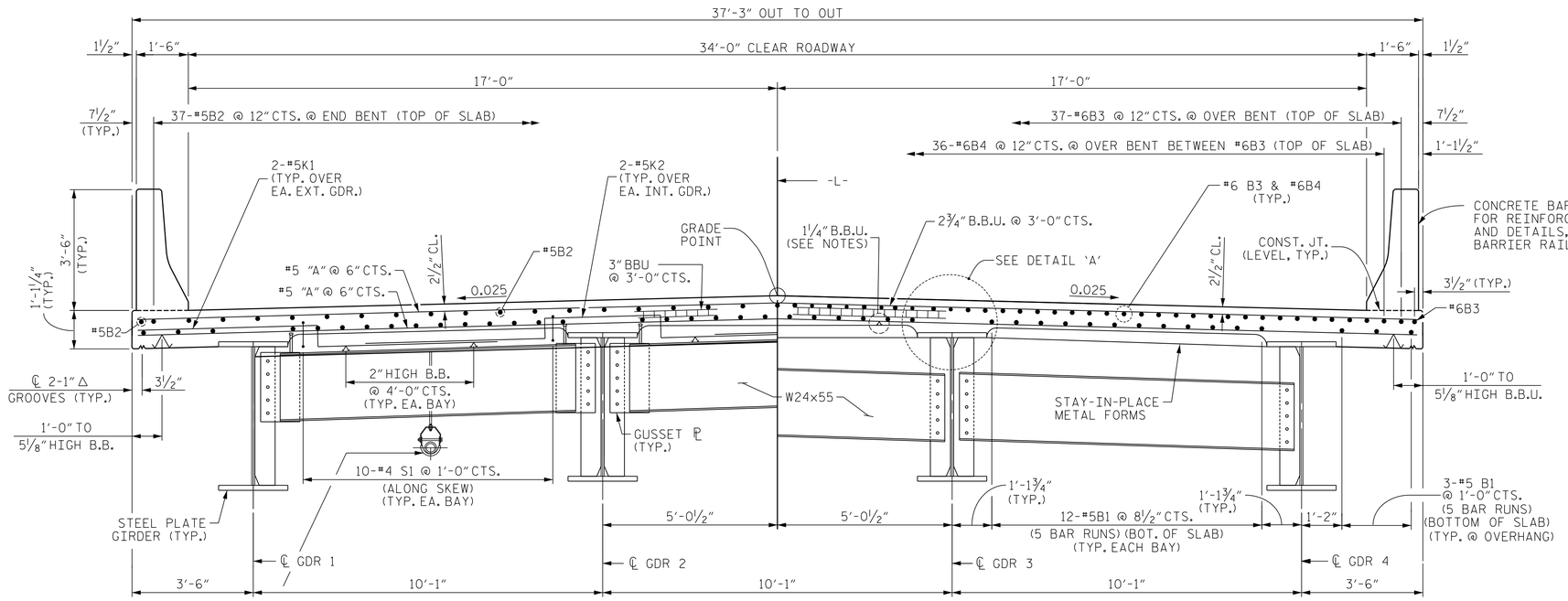
	DWN. BY: AW	DATE: 11/19
	CHKD. BY: PRG	DATE: 12/19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-06
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42



FIBER OPTIC CONDUIT (SEE "FIBER OPTIC CONDUIT SYSTEM WITH HANGERS" SHEET FOR DETAILS)

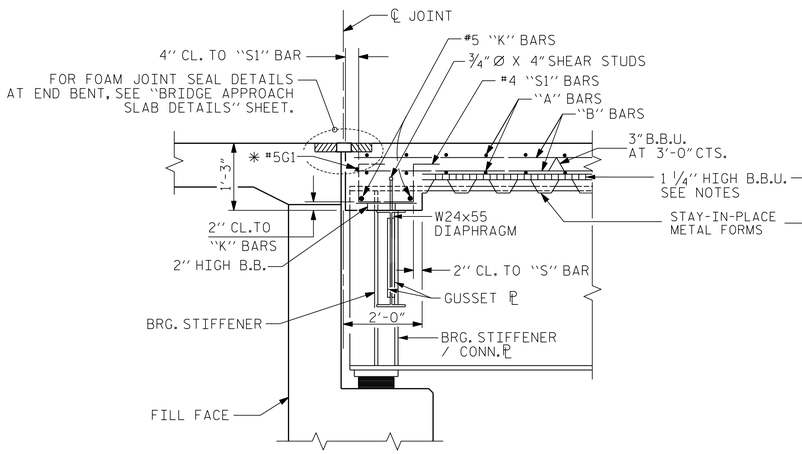
PARTIAL TYPICAL SECTION

AT END BENT DIAPHRAGMS
STAY-IN-PLACE FORMS NOT SHOWN FOR CLARITY

TYPICAL SECTION

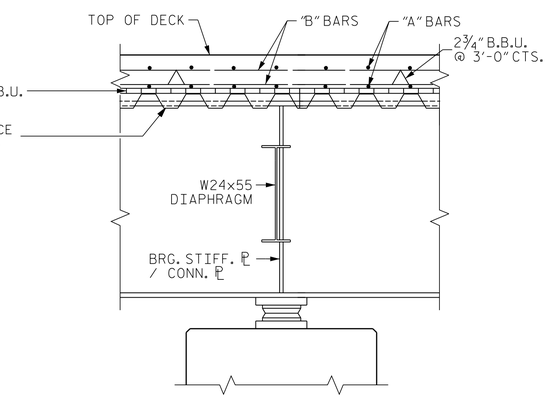
PARTIAL TYPICAL SECTION

SHOWING BENT & INTERMEDIATE DIAPHRAGMS

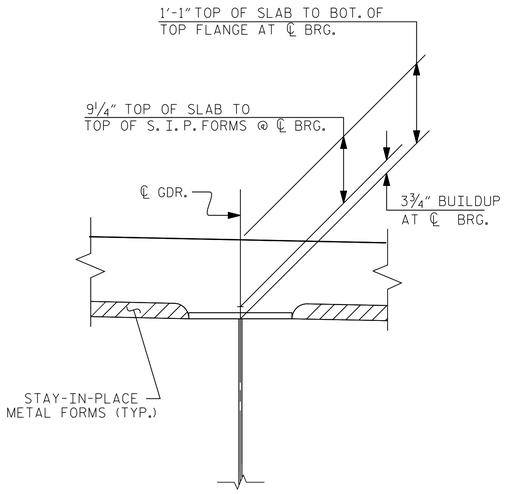


SECTION THRU END BENT

* #5G1 BAR MAY BE SHIFTED SLIGHTLY, AS NECESSARY, TO CLEAR DIAPHRAGM AND REINFORCING STEEL.



SECTION AT BENT



DETAIL "A"

NOTES

PROVIDE 1¼" HIGH BEAM BOLSTERS UPPER AT 4'-0" CTS. ATOP THE METAL STAY-IN-PLACE FORMS TO SUPPORT THE BOTTOM MAT OF 'A' BARS. WHEN USING REMOVABLE FORMS, PROVIDE CONTINUOUS HIGH CHAIRS FOR METAL DECK (C.H.C.M.) @ 4'-0" CTS. WITH A HEIGHT TO SUPPORT THE BOTTOM MAT OF 'A' BARS A CLEAR DISTANCE OF 2½" ABOVE THE TOP OF THE REMOVABLE FORM.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

PREVIOUSLY CAST CONCRETE IN A CONTINUOUS UNIT SHALL HAVE ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI BEFORE ADDITIONAL CONCRETE IS CAST IN THE UNIT.

BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THE UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3.000 PSI.

THE CONTRACTOR MAY, WHEN NECESSARY, PROPOSE A SCHEME FOR AVOIDING INTERFERENCE BETWEEN STAY-IN-PLACE METAL FORM SUPPORTS OR FORMS AND GIRDER STIFFENERS OR CONNECTOR PLATES. THE PROPOSAL SHALL BE INDICATED, AS APPROPRIATE, ON EITHER THE STEEL WORKING DRAWINGS OR THE STAY-IN-PLACE METAL FORM WORKING DRAWINGS.

METAL STAY-IN-PLACE FORMS SHALL NOT BE WELDED TO GIRDER FLANGES IN THE ZONES REQUIRING CHARPY V-NOTCH TEST. SEE STRUCTURAL STEEL DETAIL SHEETS.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

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Atlanta, GA 770-627-3590

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

TYPICAL SECTION

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

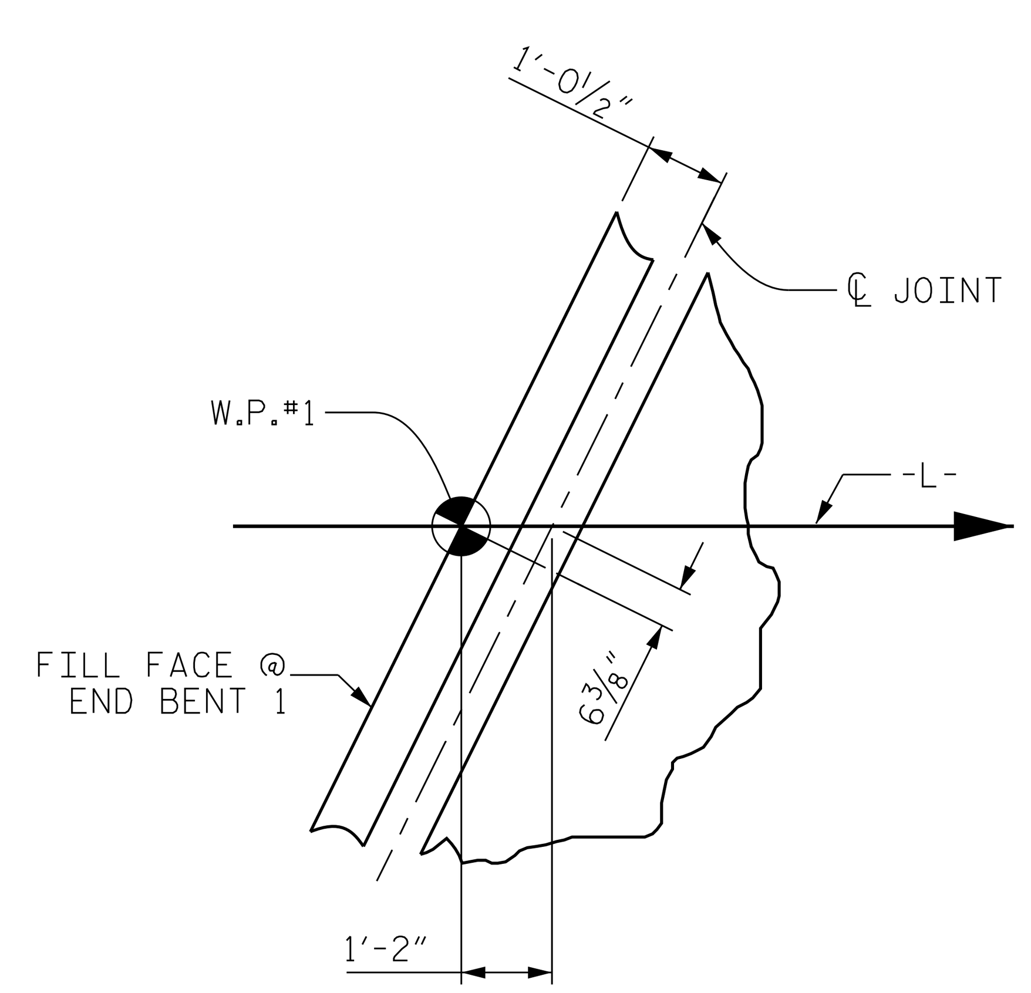
DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-07
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42

PLAN OF SPAN A

FOR BARRIER REINFORCING AND DETAILS.
SEE "CONCRETE BARRIER RAIL DETAILS".



DETAIL "A"

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-

SHEET 1 OF 2

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
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DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

PLAN OF SPAN A

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CHKD. BY: PRG DATE: 12/19

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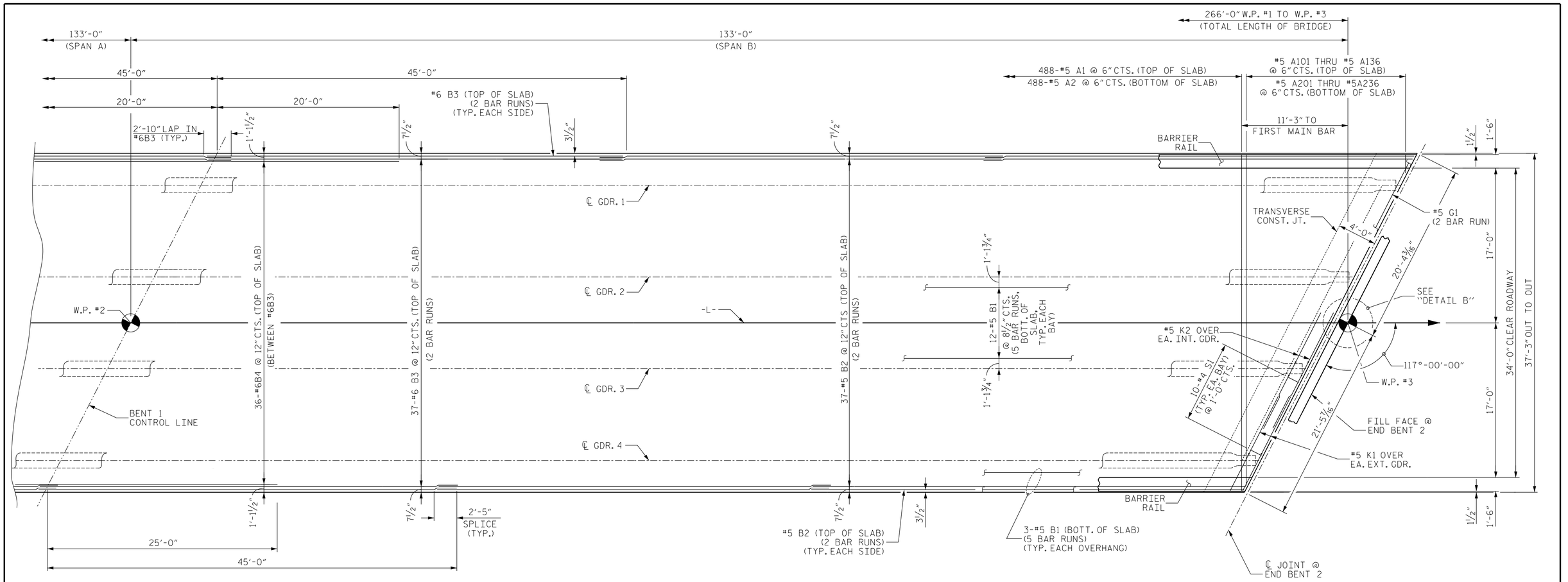
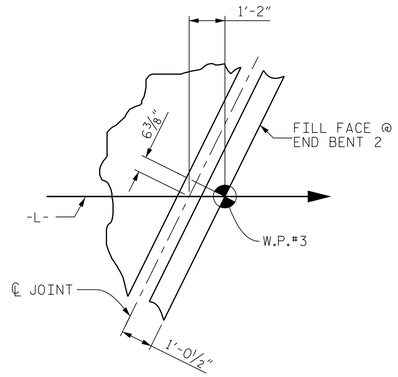
NO.	BY:	DATE:		NO.	BY:	DATE:	
1				3			
2				4			

SHEET NO. S1-08
TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42



PLAN OF SPAN B



DETAIL "B"

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+52.32 -L-

SHEET 2 OF 2

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
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STATE OF NORTH CAROLINA
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PLAN OF SPAN B

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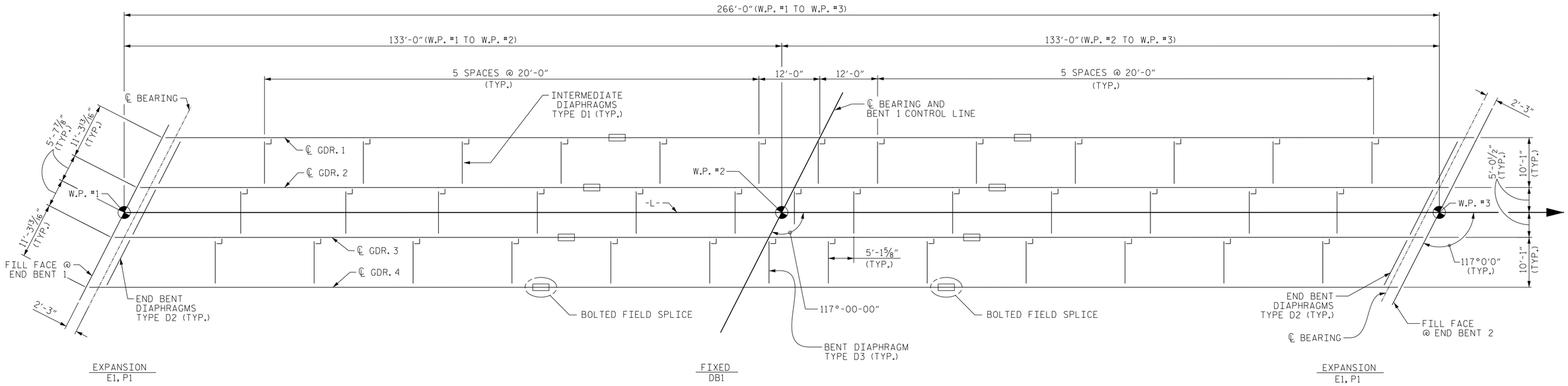
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-09
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42



FRAMING PLAN

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
4/3/2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

FRAMING PLAN

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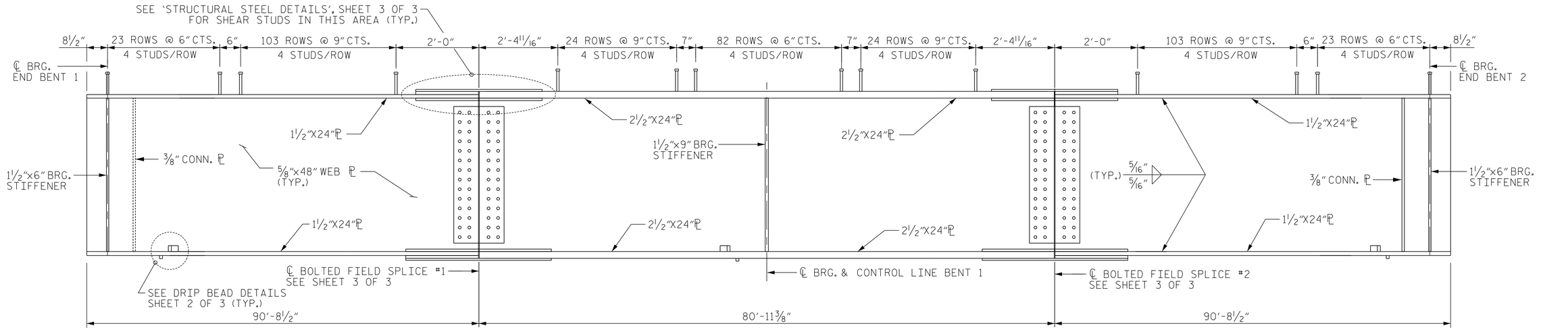
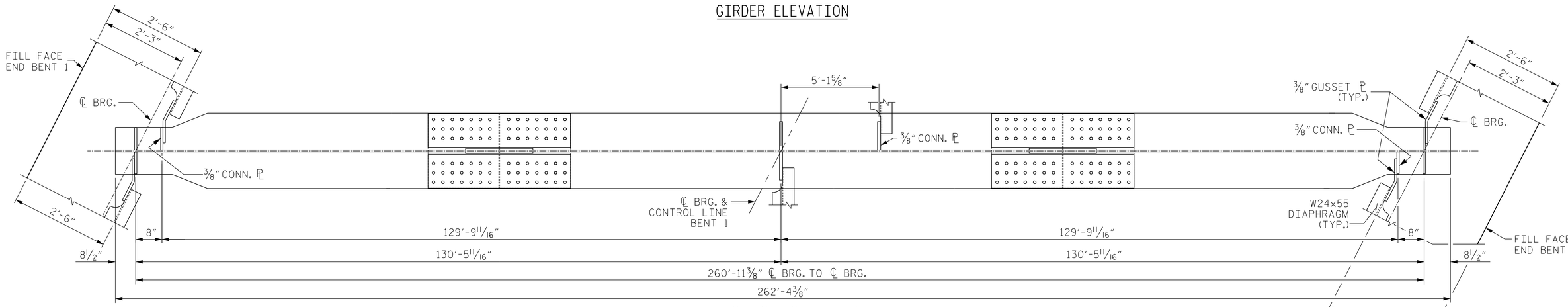
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-10
TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42

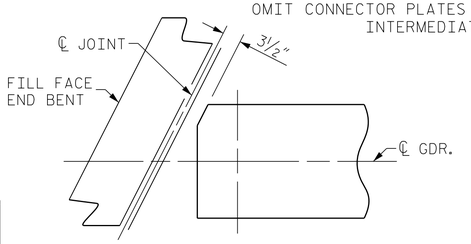


GIRDER ELEVATION



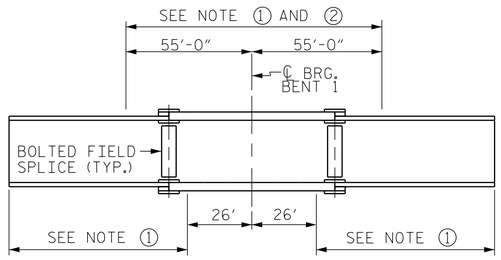
PLAN OF BOTTOM FLANGE

OMIT CONNECTOR PLATES ON OUTSIDE OF EXTERIOR GIRDERS
INTERMEDIATE DIAPHRAGMS NOT SHOWN



TOP FLANGE CLIP DETAIL

(TYP. EACH END)

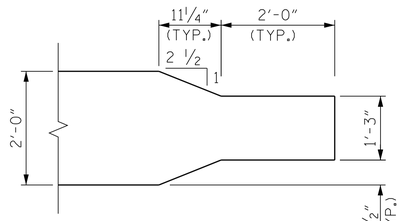


GIRDER MAKE UP

NOTE ①: CHARPY V-NOTCH TESTS ARE REQUIRED FOR ALL TOP OR BOTTOM FLANGE PLATES WHICH FALL WITHINTHESE LIMITS, ALL WEB PLATES, AND ALL SPLICE PLATES. IF A PERMITTED SHOP FLANGE SPLICE IS NOT USED, CHARPY V-NOTCH TESTS WILL BE REQUIRED FOR THE ENTIRE FLANGE PLATE. FOR CHARPY V-NOTCHTESTS, SEE ARTICLE 1072-7 OF THE STANDARD SPECIFICATIONS.

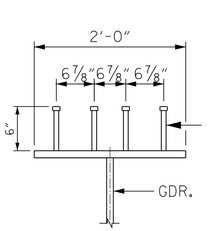
NOTE ②: NO WELDING OF FORMS OR FALSEWORK TO THE TOP FLANGE WILL BE PERMITTED IN THIS REGION.

CHARPY V-NOTCH TESTS FOR CONTINUOUS PLATE GIRDERS

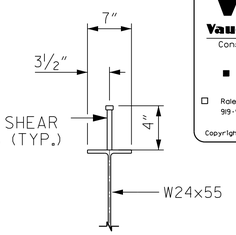


END OF GIRDER DETAIL

BOTTOM FLANGE ONLY



STUDS ON GIRDERS



STUDS ON END BENT DIAPHRAGMS

SHEAR STUD DETAILS

SHEAR STUDS ARE TO BE SHOP WELDED ON TOP OF GIRDER PLATE BEFORE FIELD ASSEMBLY

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

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SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

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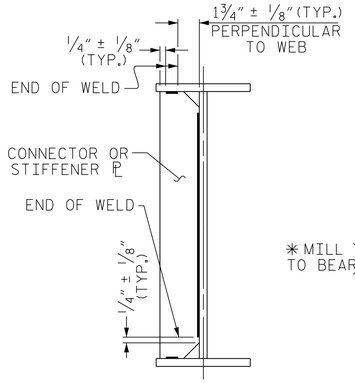
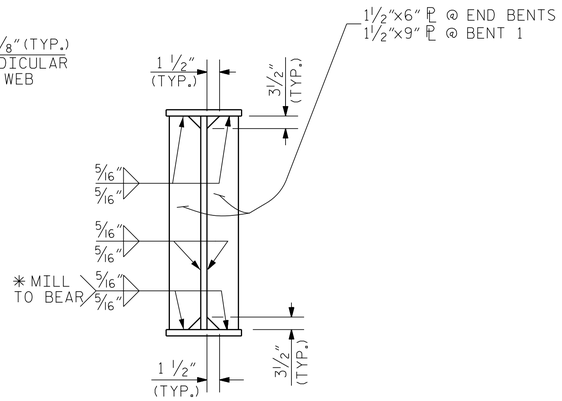
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-11
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42



WELD TERMINATION DETAIL

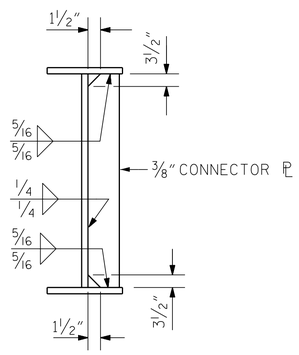


BEARING STIFFENER

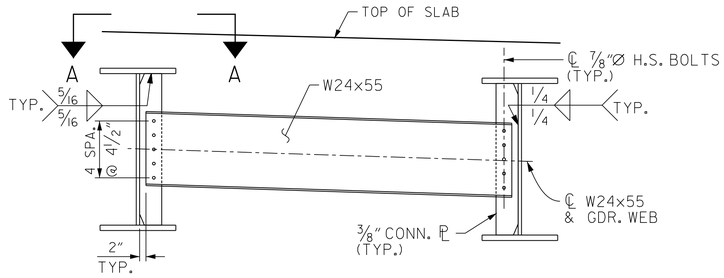
(AT BENT 1 & END BENTS)

✳ WELD ONLY WHEN USED AS CONNECTOR PLATE

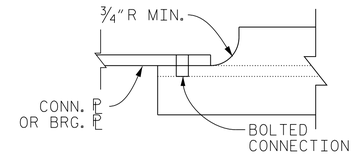
(BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE)



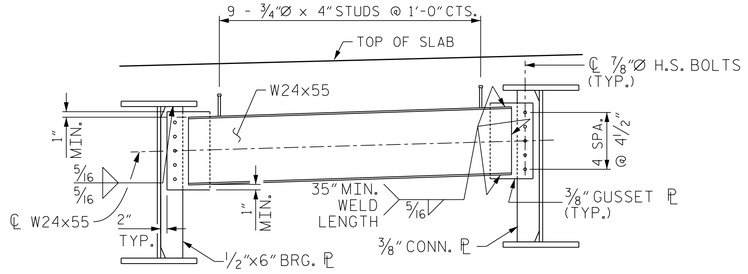
CONNECTOR PLATE



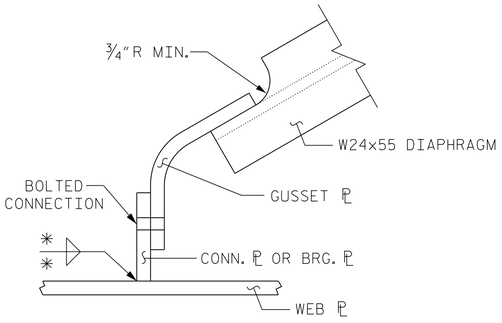
TYPICAL INTERMEDIATE DIAPHRAGM (D1)



SECTION A-A

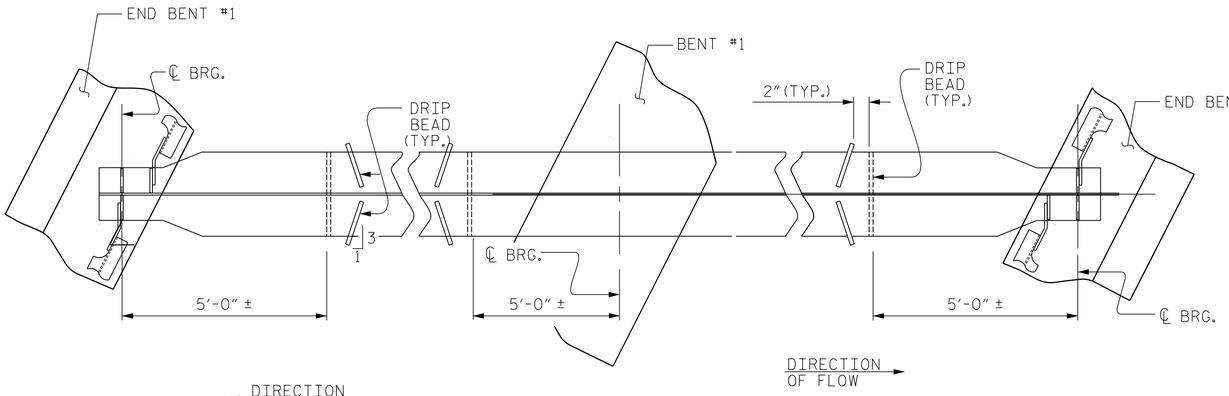


TYPICAL END BENT DIAPHRAGM (D2)



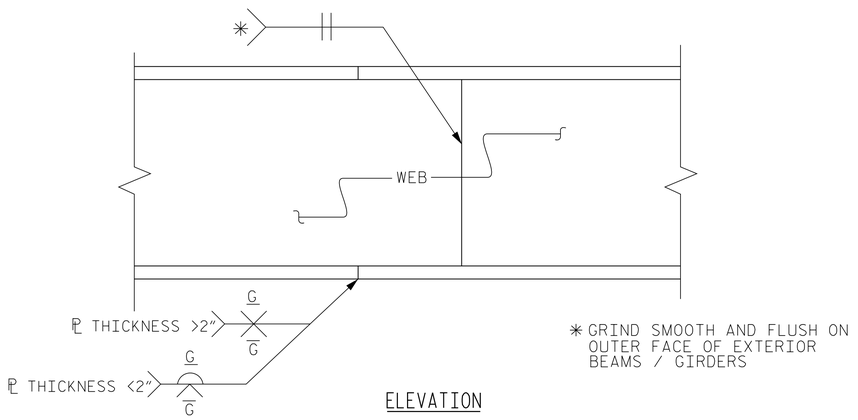
GUSSET ℙ DETAIL

✳ 5/16" @ BRG. ℙ
¼" @ CONN. ℙ



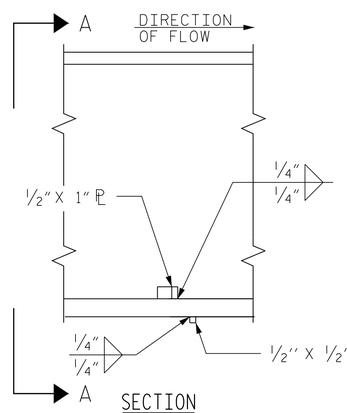
PART PLAN - BOTTOM FLANGE

TYPICAL BENT DIAPHRAGM (D3)

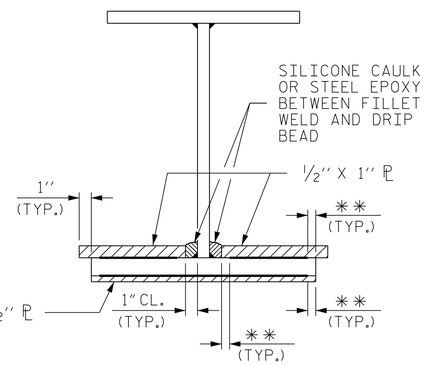


ELEVATION

TYPICAL FLANGE AND WEB BUTT JOINT



SECTION



VIEW A-A

DRIP BEAD DETAILS

✳✳ SEE WELD TERMINATION DETAILS

V&M
Vaughn & Melton
Consulting Engineers
Asheville, ■ North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

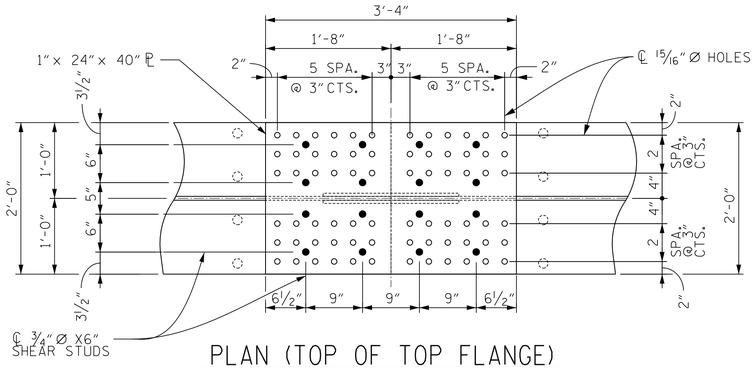
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
DocuSigned by: 4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

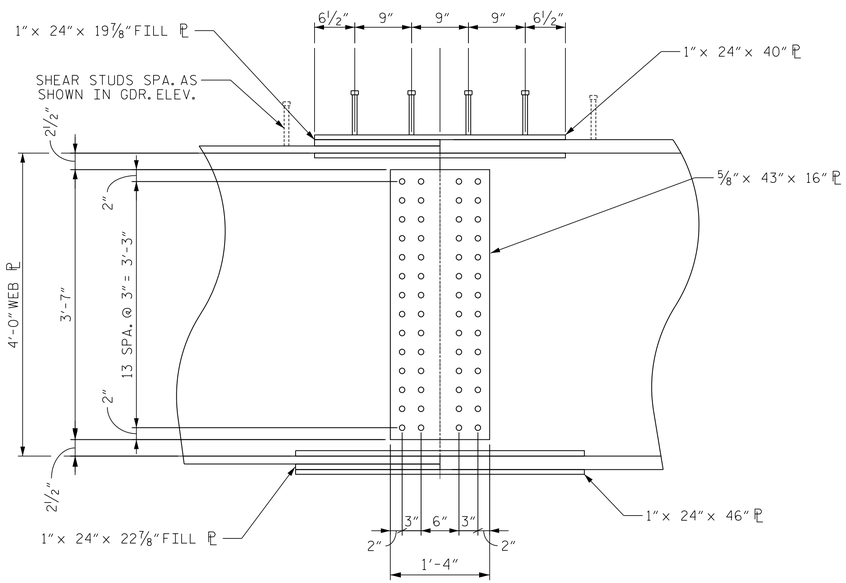
DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-12
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42

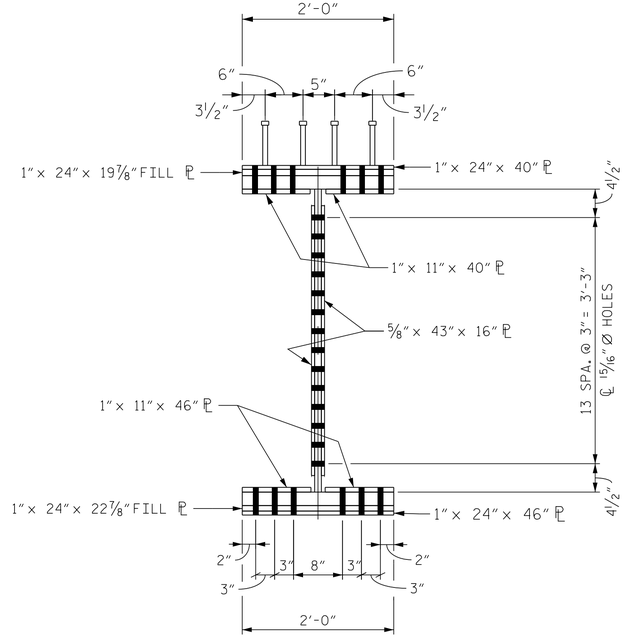


PLAN (TOP OF TOP FLANGE)

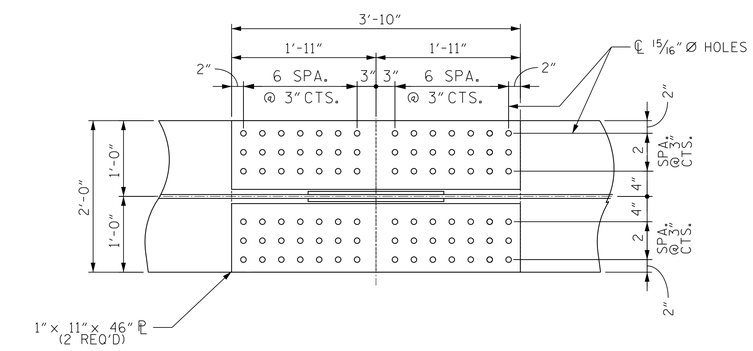


ELEVATION

SPLICE #1 SHOWN,
SPLICE #2 SIMILAR BY ROTATION



SECTION



PLAN (TOP OF BOTTOM FLANGE)

NOTES:

ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 50W AND PAINTED IN ACCORDANCE WITH SYSTEM 5 OR 6 OF THE STRUCTURAL STEEL SHOP COATINGS PROGRAM AND SECTION 442-8 OF THE STANDARD SPECIFICATIONS UNLESS OTHERWISE NOTED ON THE PLANS.

BEARING STIFFENERS ARE TO BE PLACED NORMAL TO THE WEB OF THE GIRDER AND SHALL BE PLUMB.

PERMITTED FLANGE AND WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15 FEET OF MAXIMUM DEAD LOAD DEFLECTION (NOR WITHIN 15 FEET OF INTERMEDIATE BEARINGS OF CONTINUOUS UNITS). KEEP 2 FEET MINIMUM BETWEEN WEB AND FLANGE SHOP SPLICES. KEEP 6 INCHES MINIMUM BETWEEN CONNECTOR PLATE OR TRANSVERSE STIFFENER WELDS AND WEB OR FLANGE SHOP SPLICES.

ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

FABRICATORS SHALL DETAIL DIAPHRAGM MEMBERS AND CONNECTIONS FOR FULL DEAD LOAD FIT UP.

GIRDERS SHALL BE PLUMB AFTER THE FULL AMOUNT OF DEAD LOAD IS APPLIED.

ALL FIELD CONNECTIONS SHALL BE ⅞"Ø HIGH STRENGTH BOLTS UNLESS OTHERWISE NOTED.

TENSION ON THE ASTM F3125 BOLTS SHALL BE CALIBRATED USING DIRECT TENSION INDICATOR WASHERS IN ACCORDANCE WITH ARTICLE 440-8 OF THE STANDARD SPECIFICATIONS.

END OF GIRDERS SHALL BE PLUMB.

BEARING STIFFENER MAY REQUIRE COPING IF WIDER THAN BOTTOM FLANGE.

STRUCTURAL STEEL ERECTION IN A CONTINUOUS UNIT SHALL BE COMPLETE BEFORE FALSEWORK OR FORMS ARE PLACED ON THE UNIT.

STUDS ON GIRDERS MAY BE SHIFTED UP TO 1" IF NECESSARY TO CLEAR FLANGE SPLICE WELD.

V&M
Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-627-3590

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

STRUCTURAL STEEL DETAILS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
DocuSigned by
4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-13
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42

DEAD LOAD DEFLECTION TABLE FOR GIRDERS

GIRDER 1

SPAN A

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.017	0.020	0.022	0.024	0.024	0.024	0.023	0.021	0.019	0.016	0.013	0.010	0.007	0.005	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.173	0.221	0.260	0.089	0.308	0.315	0.313	0.300	0.277	0.245	0.211	0.172	0.132	0.093	0.058	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0037	0.070	0.099	0.124	0.145	0.162	0.176	0.185	0.191	0.193	0.191	0.185	0.176	0.162	0.145	0.124	0.098	0.070	0.037	0.000
REQUIRED CAMBER ↑	0	1⅛″	2¼″	3¼″	4⅛″	4⅞″	5⅞″	5¹³⁄₁₆″	6″	6⅛″	5¹⁵⁄₁₆″	5⅝″	5³⁄₁₆″	4⅝″	4″	3⅝″	2⅝″	1⅞″	1³⁄₁₆″	⅝″	0″

SPAN B

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.017	0.020	0.022	0.024	0.024	0.024	0.023	0.021	0.019	0.016	0.013	0.010	0.007	0.005	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.173	0.221	0.260	0.089	0.308	0.315	0.313	0.300	0.277	0.245	0.211	0.172	0.132	0.093	0.058	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.035	0.066	0.093	0.117	0.136	0.152	0.163	0.171	0.175	0.175	0.172	0.164	0.153	0.137	0.118	0.095	0.068	0.038	0.003	0.000
REQUIRED CAMBER ↑	0	½″	1⅛″	1¹³⁄₁₆″	2½″	3³⁄₁₆″	3⅞″	4½″	5″	5⅞″	5¹¹⁄₁₆″	5¹³⁄₁₆″	5¾″	5½″	5⅛″	4⅜″	3¹³⁄₁₆″	2⅞″	1⅞″	¾″	0″

GIRDER 2

SPAN A

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.016	0.019	0.021	0.023	0.023	0.023	0.022	0.021	0.017	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.172	0.220	0.259	0.288	0.307	0.314	0.312	0.299	0.277	0.244	0.211	0.172	0.131	0.093	0.057	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.037	0.070	0.099	0.124	0.145	0.162	0.176	0.185	0.191	0.193	0.191	0.185	0.176	0.162	0.145	0.124	0.098	0.069	0.037	0.000
REQUIRED CAMBER ↑	0	1⅛″	2¼″	3¼″	4⅛″	4⅞″	5⅜″	5¹³⁄₁₆″	6″	6⅛″	5⅞″	5⅝″	5⅛″	4⅝″	4″	3⅝″	2⁹⁄₁₆″	1⅞″	1³⁄₁₆″	⅝″	0″

SPAN B

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.016	0.019	0.021	0.023	0.023	0.023	0.022	0.021	0.017	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.172	0.220	0.259	0.288	0.307	0.314	0.312	0.299	0.277	0.244	0.211	0.172	0.131	0.093	0.057	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.035	0.066	0.094	0.117	0.137	0.153	0.164	0.172	0.177	0.177	0.173	0.166	0.155	0.139	0.120	0.098	0.071	0.040	0.006	0.000
REQUIRED CAMBER ↑	0	½″	1⅛″	1¹³⁄₁₆″	2½″	3³⁄₁₆″	3⅞″	4½″	5″	5⅞″	5¹¹⁄₁₆″	5¹³⁄₁₆″	5¾″	5⁹⁄₁₆″	5⅛″	4⅜″	3¹³⁄₁₆″	2¹⁵⁄₁₆″	1⅞″	¾″	0″

GIRDER 3

SPAN A

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.017	0.020	0.022	0.024	0.024	0.024	0.023	0.021	0.019	0.016	0.013	0.010	0.007	0.005	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.173	0.221	0.260	0.289	0.308	0.315	0.313	0.300	0.277	0.245	0.211	0.172	0.132	0.093	0.058	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.037	0.070	0.099	0.124	0.145	0.162	0.176	0.185	0.191	0.193	0.191	0.185	0.176	0.162	0.145	0.124	0.098	0.069	0.037	0.000
REQUIRED CAMBER ↑	0	1⅛″	2¼″	3¼″	4⅛″	4⅞″	5⅜″	5¹³⁄₁₆″	6″	6⅛″	5¹⁵⁄₁₆″	5⅝″	5³⁄₁₆″	4⅝″	4″	3⅝″	2⅝″	1⅞″	1³⁄₁₆″	⅝″	0″

SPAN B

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.016	0.019	0.021	0.023	0.023	0.023	0.022	0.021	0.017	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.172	0.220	0.259	0.288	0.307	0.314	0.312	0.299	0.277	0.244	0.211	0.172	0.131	0.093	0.057	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.035	0.067	0.094	0.118	0.138	0.153	0.165	0.174	0.178	0.178	0.175	0.168	0.157	0.142	0.123	0.100	0.073	0.043	0.009	0.000
REQUIRED CAMBER ↑	0	1⅛″	2¼″	3¼″	4⅛″	4⅞″	5⅜″	5¹³⁄₁₆″	6″	6⅛″	5¹⁵⁄₁₆″	5⅝″	5³⁄₁₆″	4⅝″	4″	3⅝″	2⅝″	1⅞″	1³⁄₁₆″	⅝″	0″

GIRDER 4

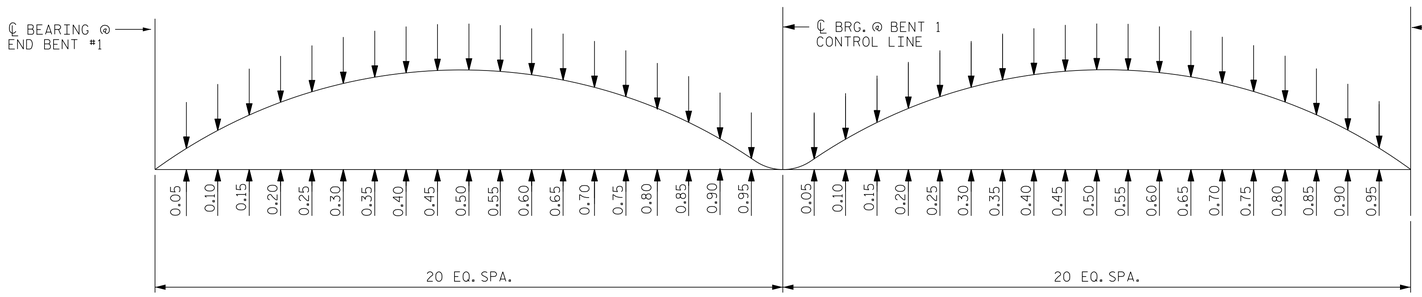
SPAN A

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.016	0.019	0.021	0.023	0.023	0.023	0.022	0.021	0.017	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.172	0.220	0.259	0.288	0.307	0.314	0.312	0.299	0.277	0.244	0.211	0.172	0.131	0.093	0.057	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.037	0.070	0.099	0.124	0.145	0.162	0.176	0.185	0.191	0.193	0.191	0.185	0.176	0.162	0.145	0.123	0.098	0.069	0.036	0.000
REQUIRED CAMBER ↑	0	1⅛″	2¼″	3¼″	4⅛″	4⅞″	5⅜″	5¹³⁄₁₆″	6″	6⅛″	5⅞″	5⅝″	5¹⁄₁₆″	4⅝″	4″	3⅝″	2⁹⁄₁₆″	1⅞″	1³⁄₁₆″	⅝″	0″

SPAN B

TWENTIETH POINTS	0	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.65	0.70	0.75	0.80	0.85	0.90	0.95	0
DEFLECTION DUE TO WEIGHT OF GIRDER ↓	0.000	0.010	0.020	0.029	0.037	0.043	0.048	0.051	0.053	0.052	0.050	0.046	0.040	0.036	0.029	0.022	0.016	0.010	0.005	0.001	0.000
DEFLECTION DUE TO WEIGHT OF SLAB ✳ ↓	0.000	0.044	0.089	0.131	0.167	0.197	0.219	0.233	0.239	0.236	0.227	0.210	0.187	0.159	0.130	0.099	0.070	0.043	0.021	0.006	0.000
DEFLECTION DUE TO WEIGHT OF BARRIER RAIL ↓	0.000	0.004	0.009	0.013	0.016	0.019	0.021	0.023	0.023	0.023	0.022	0.021	0.017	0.016	0.013	0.010	0.007	0.004	0.002	0.001	0.000
TOTAL DEAD LOAD DEFLECTION ↓	0.000	0.058	0.118	0.172	0.220	0.259	0.288	0.307	0.314	0.312	0.299	0.277	0.244	0.211	0.172	0.131	0.093	0.057	0.028	0.008	0.000
VERTICAL CURVE ORDINATE ↑	0.000	0.035	0.067	0.095	0.118	0.138	0.154	0.167	0.175	0.179	0.180	0.177	0.170	0.159	0.144	0.125	0.102	0.076	0.046	0.011	0.000
REQUIRED CAMBER ↑	0	½″	1⅛″	1¹³⁄₁₆″	2½″	3¼″	3¹⁵⁄₁₆″	4½″	5″	5½″	5¾″	5⅞″	5¹³⁄₁₆″	5⅜″	5³⁄₁₆″	4⅝″	3⅞″	3″	1¹⁵⁄₁₆″	¹³⁄₁₆″	0″

✳ INCLUDES SLAB, BUILDUPS & STAY-IN-PLACE FORMS.



SPAN A SPAN B

SCHEMATIC CAMBER ORDINATES

FOR CAMBER VALUES AT EACH GIRDER TWENTIETH POINT, SEE TABLE ABOVE.

NOTES:

ALL VALUES ARE SHOWN IN FEET (DECIMAL FORM), EXCEPT "FINAL CAMBER", WHICH IS GIVEN IN INCHES (FRACTION FORM).

SLOPE FOR THE ZERO CAMBER BASE LINE VARIES.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DEAD LOAD DEFLECTION TABLES

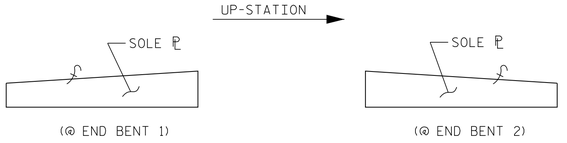
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DSG. ENG. OF RECORD.: PRG
DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

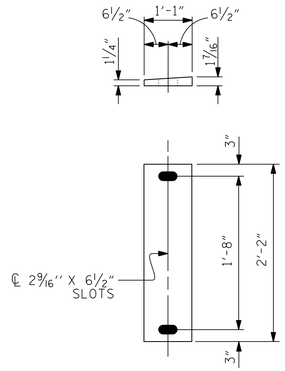
REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-14
TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42

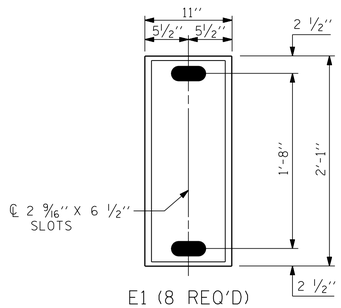


SOLE PLATE PLACEMENT DETAIL



P1
(EXPANSION)
(8 REQ'D)

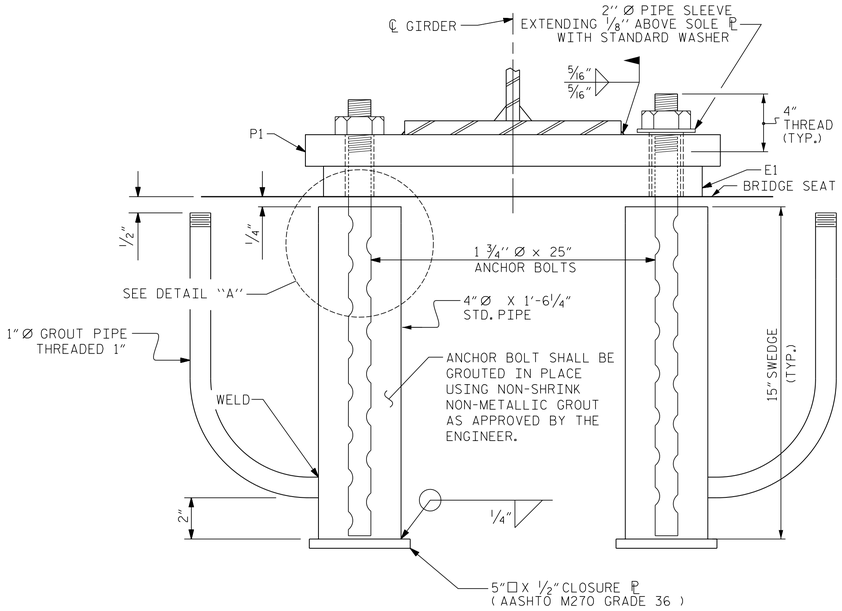
SOLE PLATE DETAILS ("P")



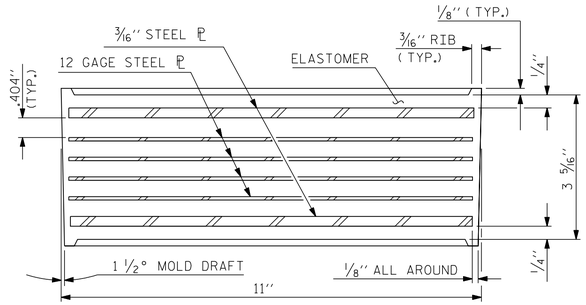
E1 (8 REQ'D)

PLAN VIEW OF ELASTOMERIC BEARING

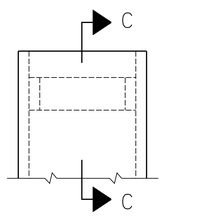
TYPE IV

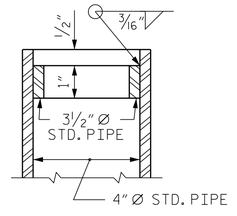


EXPANSION END VIEW



TYPICAL SECTION OF ELASTOMERIC BEARING





SECTION C-C

DETAIL "A"

NOTES

AT ALL FIXED POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS ARE TO BE TIGHTENED FINGER TIGHT AND THEN BACKED OFF ½ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

THE 2" Ø PIPE SLEEVE SHALL BE CUT FROM SCHEDULE 40 PVC PLASTIC PIPE. THE PVC PLASTIC PIPE SHALL MEET THE REQUIREMENTS OF ASTM D1785.

THE PAYMENT FOR THE PIPE SLEEVES SHALL BE INCLUDED IN THE SEVERAL PAY ITEMS.

FOR PAINTED STRUCTURAL STEEL (EXCLUDING AASHTO M270 GRADE 50W), SOLE PLATES, ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

FOR AASHTO M270 GRADE 50W STRUCTURAL STEEL, SOLE PLATE SHALL BE AASHTO M270 GRADE 50W AND SHALL NOT BE GALVANIZED. ANCHOR BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ANCHOR BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A449. NUTS SHALL MEET THE REQUIREMENTS OF AASHTO M291-DH OR AASHTO M292-2H. WASHERS SHALL MEET THE REQUIREMENTS OF AASHTO M293. SHOP DRAWINGS ARE NOT REQUIRED FOR ANCHOR BOLTS, NUTS AND WASHERS. SHOP INSPECTION IS REQUIRED.

WHEN FIELD WELDING THE SOLE PLATE TO THE GIRDER FLANGE, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE SOLE PLATE DOES NOT EXCEED 300°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE ELASTOMER.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

THE ELASTOMER IN THE STEEL REINFORCED BEARINGS SHALL HAVE A SHEAR MODULUS OF 0.160 KSI, IN ACCORDANCE WITH AASHTO M251.

FOR STEEL REINFORCED ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

THE CLOSURE PLATE, GROUT PIPE, AND STANDARD PIPE FOR THE EXPANSION ASSEMBLY NEED NOT BE GALVANIZED.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FOLLOWING PROCEDURE, WHICH MAY BE REQUIRED BY THE ENGINEER, TO RESET ELASTOMERIC BEARINGS DUE TO GIRDER TRANSLATION AND END ROTATION:

1. ONCE THE DECK HAS CURED, THE GIRDERS SHALL BE JACKED THEN THE ANCHOR BOLTS AND ELASTOMERIC BEARING SLOTS CENTERED AS NEARLY AS PRACTICAL ABOUT THE BEARING STIFFENER. THIS OPERATION SHALL BE PERFORMED AT APPROXIMATELY 60° F
2. AFTER CENTERING THE ELASTOMERIC BEARING SLOTS AND ANCHOR BOLTS, THE ANCHOR BOLTS SHALL BE GROUTED.

THE CONTRACTOR MAY PROPOSE ALTERNATE METHODS, PROVIDED DETAILS ARE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.

MAXIMUM ALLOWABLE SERVICE LOADS	
D.L.+L.L. (NO IMPACT)	
TYPE IV	310 k

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-=
13+14.02 -SBL-
29+02.29 -L-=
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

ELASTOMERIC BEARING DETAILS

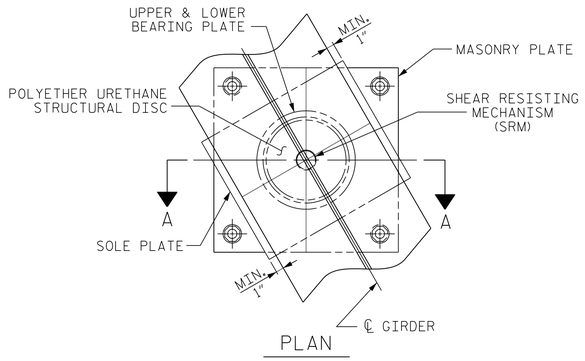
(STEEL SUPERSTRUCTURE)

DRAWN BY : JMB 11/87	REV. 10/1/11 MAA/GM
CHECKED BY : ARB 11/87	REV. 6/13 AAC/MAA
	REV. 12/17 MAA/THC

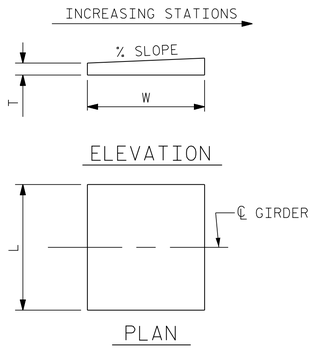
ASSEMBLED BY : AW DATE : 7/2019
CHECKED BY : PRG DATE : 12/2019
DES EGR OF RECORD: PRG DATE : 12/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-15
1			3			TOTAL SHEETS
2			4			31

STD. NO. EB1

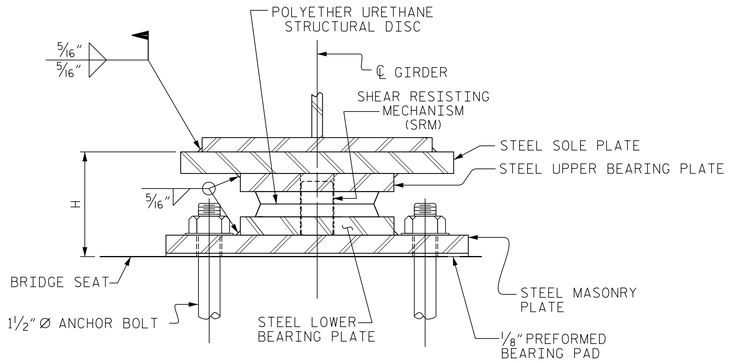


PLAN

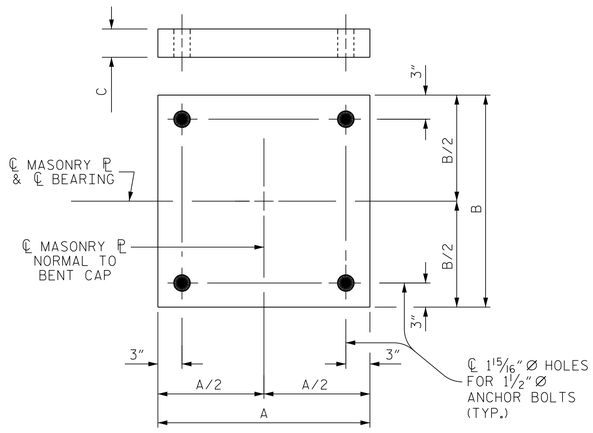


NOTE:
DIMENSIONS "W", AND "T" SHALL BE DETERMINED BY THE BEARING MANUFACTURER.

SOLE PLATE DETAILS



SECTION A-A
DB1, FIXED



PLAN

MASONRY PLATE DETAILS

DESIGNATIONS		LOCATION	NUMBER OF BEARINGS	DIMENSIONS						LOADS AND MOVEMENT				
				BEARING	MASONRY PLATE			SOLE PLATE		UNFACTORED VERTICAL LOAD (KIPS)			FACTORED HORIZONTAL LOAD (KIPS)	ONE-WAY MOVEMENT (IN.)
BEARINGS	MASONRY ℙ			H (IN.)	A (IN.)	B (IN.)	C (IN.)	TOP SLOPE (%)	L (IN.)	DEAD		LIVE		
										DC	DW	LL+IM		
DB1 (FIXED)	M1	BENT 1	4	6⅜"	26½"	26½"	1	0.4	26	352	43	262	131	0

NOTES

FOR DISC BEARINGS, SEE SPECIAL PROVISIONS.

ALL BEARING PLATES SHALL BE AASHTO M270 GRADE 50W OR GRADE 50.

AT ALL POINTS OF SUPPORT, NUTS FOR ANCHOR BOLTS SHALL BE FINGER-TIGHTENED PLUS AN ADDITIONAL ¼ TURN. THE THREAD OF THE NUT AND BOLT SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.

WHEN WELDING THE SOLE PLATE TO THE GIRDER, USE TEMPERATURE INDICATING WAX PENS, OR OTHER SUITABLE MEANS, TO ENSURE THAT THE TEMPERATURE OF THE BEARING DOES NOT EXCEED 250°F. TEMPERATURES ABOVE THIS MAY DAMAGE THE TFE OR URETHANE DISC.

SOLE PLATES SHOULD BE WELDED TO GIRDER FLANGES BEFORE FALSEWORK IS PLACED.

ALL SURFACES OF BEARING PLATES SHALL BE SMOOTH AND STRAIGHT.

FOR THERMAL SPRAYED COATINGS (METALLIZATION), SEE SPECIAL PROVISIONS.

THE MINIMUM ROTATIONAL CAPACITY FOR ALL BEARINGS SHALL BE 0.02 RADIANS.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Documents not considered final unless sealed and signed
Patrick R. Gallagher
4/3/2020

PROJECT NO. BR-0039
NASH COUNTY
STATION: 28+02.81 -L-
13+14.02 -SBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

DISC BEARING DETAILS

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-16
1			3			TOTAL SHEETS
2			4			31

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ASSEMBLED BY : AW DATE : 08/19
CHECKED BY : PRG DATE : 12/19
DRAWN BY : TMG 08/13
CHECKED BY : EKP 10/13
REV. 12/17 MAA/THC

STD. NO. DB1

PLAN OF BARRIER RAIL

PATRICK R. GALLAGHER 042890 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL
Patrick R. Gallagher
4/3/2020

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ASSEMBLED BY : WDC DATE : 2/20
CHECKED BY : PRG DATE : 2/20

PROJECT NO. BR-0039
NASH COUNTY
STATION: 28+02.81 -L-= 13+14.02 -SBL- 29+02.29 -L-= 12+70.38 -NBL-
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

CONCRETE BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-17
1			3			TOTAL SHEETS
2			4			31

NOTES

THE BARRIER RAIL IN A CONTINUOUS UNIT SHALL NOT BE CAST UNTIL ALL SLAB CONCRETE IN THAT UNIT HAS BEEN CAST AND HAS REACHED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI.

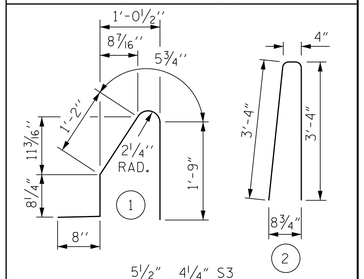
WHEN FOAM JOINT SEAL IS REQUIRED, THE JOINT IN THE DECK SHALL BE SAWED PRIOR TO THE CASTING OF BARRIER RAIL.

ALL REINFORCING STEEL IN BARRIER RAILS SHALL BE EPOXY COATED.

THE #5 S3, S4, S5 AND S6 BARS SHALL BE INSTALLED, USING AN ADHESIVE ANCHORING SYSTEM, AFTER SAWING THE JOINT. THE YIELD LOAD FOR THE #5 S3, S4, S5 AND S6 BARS IS 18.6 KIPS. FIELD TESTING FOR THE ADHESIVE BONDING SYSTEM IS NOT REQUIRED.

GROOVED CONTRACTION JOINTS, ½" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. THE CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

BAR TYPES



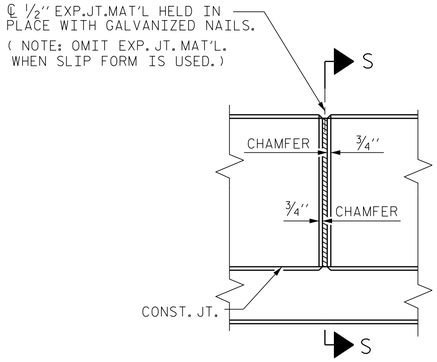
ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

FOR CONCRETE BARRIER RAIL ONLY

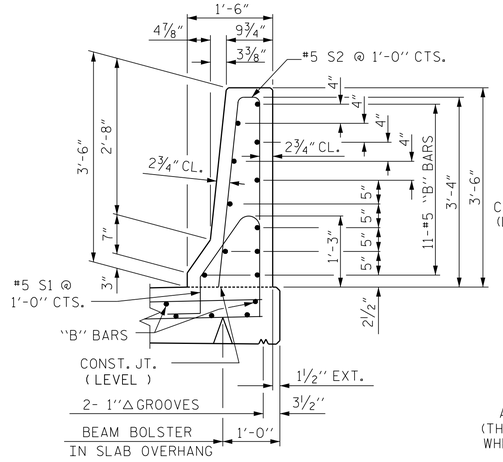
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* S1	514	#5	1	4'-9"	2546
* S2	514	#5	2	7'-0"	3753
* S3	4	#5	3	4'-2"	17
* S4	4	#5	STR	4'-0"	17
* S5	8	#5	3	3'-5"	29
* S6	8	#5	STR	3'-3"	27
* B1	176	#5	STR	29'-7"	5431
* B2	22	#5	STR	10'-11"	250
* B3	22	#5	STR	11'-10"	272

* EPOXY COATED REINFORCING STEEL	10,983 LBS.
CLASS AA CONCRETE	71.7 CU. YDS.
CONCRETE BARRIER RAIL	527.33 LIN. FT.

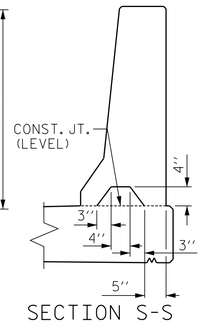


ELEVATION AT EXPANSION JOINTS

BARRIER RAIL DETAILS

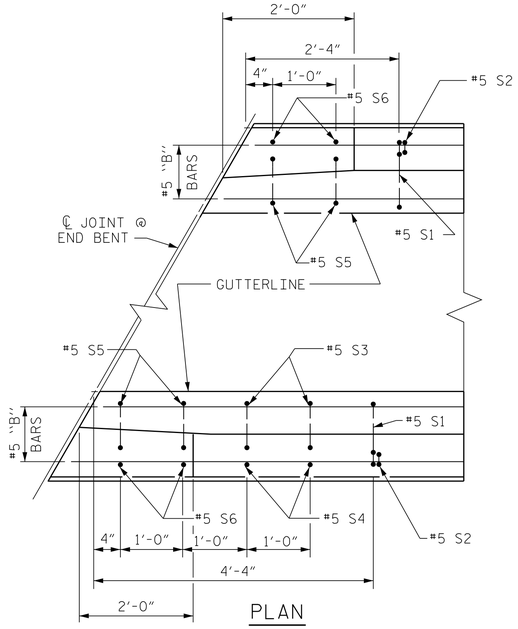


SECTION THRU RAIL

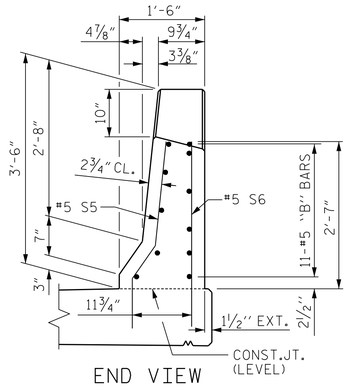


SECTION S-S

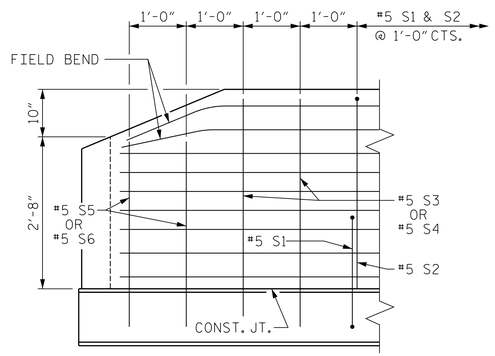
AT DAM IN OPEN JOINT
(THIS IS TO BE USED ONLY WHEN SLIP FORM IS USED)



PLAN



END VIEW



SIDE VIEW

END OF RAIL DETAILS

FOR ADHESIVE ANCHORING AT SAWED JOINTS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

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PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-=
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29+02.29 -L-=
12+70.38 -NBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

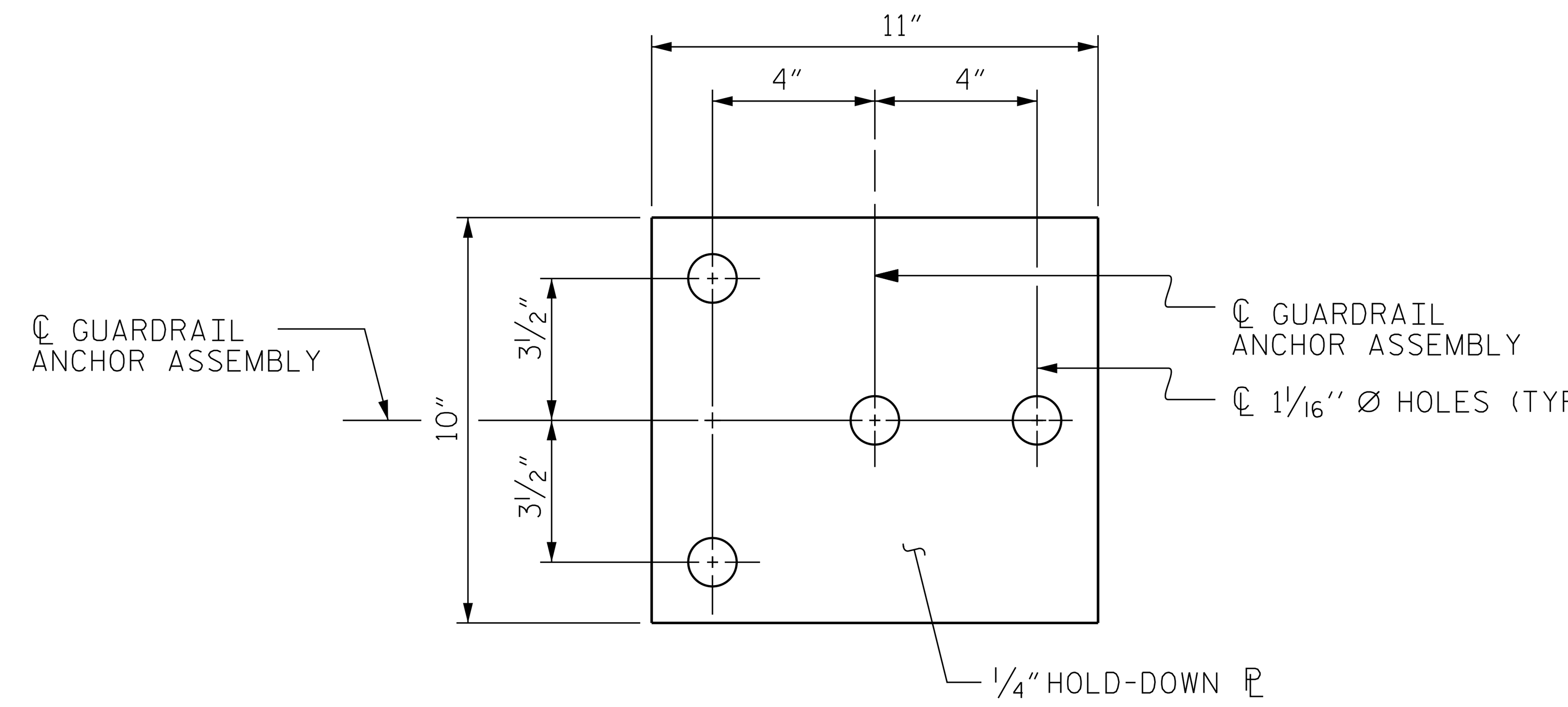
STANDARD

CONCRETE BARRIER RAIL

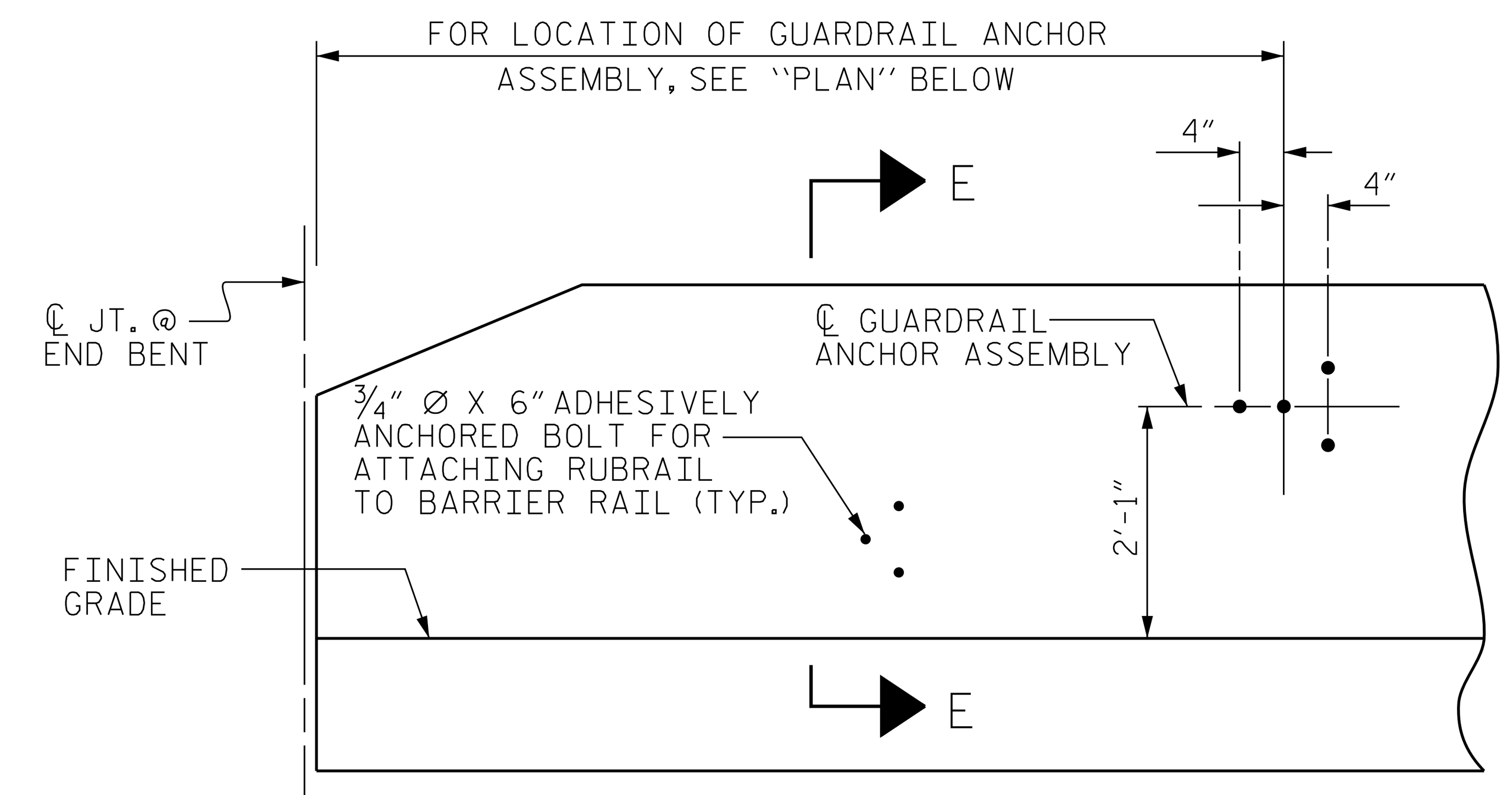
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-18
1			3			TOTAL SHEETS
2			4			31

ASSEMBLED BY : WDC	DATE : 2-20	
CHECKED BY : PRG	DATE : 2/20	
DRAWN BY : ARB 5/87	REV. 7/12	MAA/GM
CHECKED BY : SJD 9/87	REV. 6/13	MAA/GM
	REV. 12/17	MAA/THC

STD. NO. CBR1



PLAN



ELEVATION

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD-DOWN PLATE AND 4 - 7/8" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

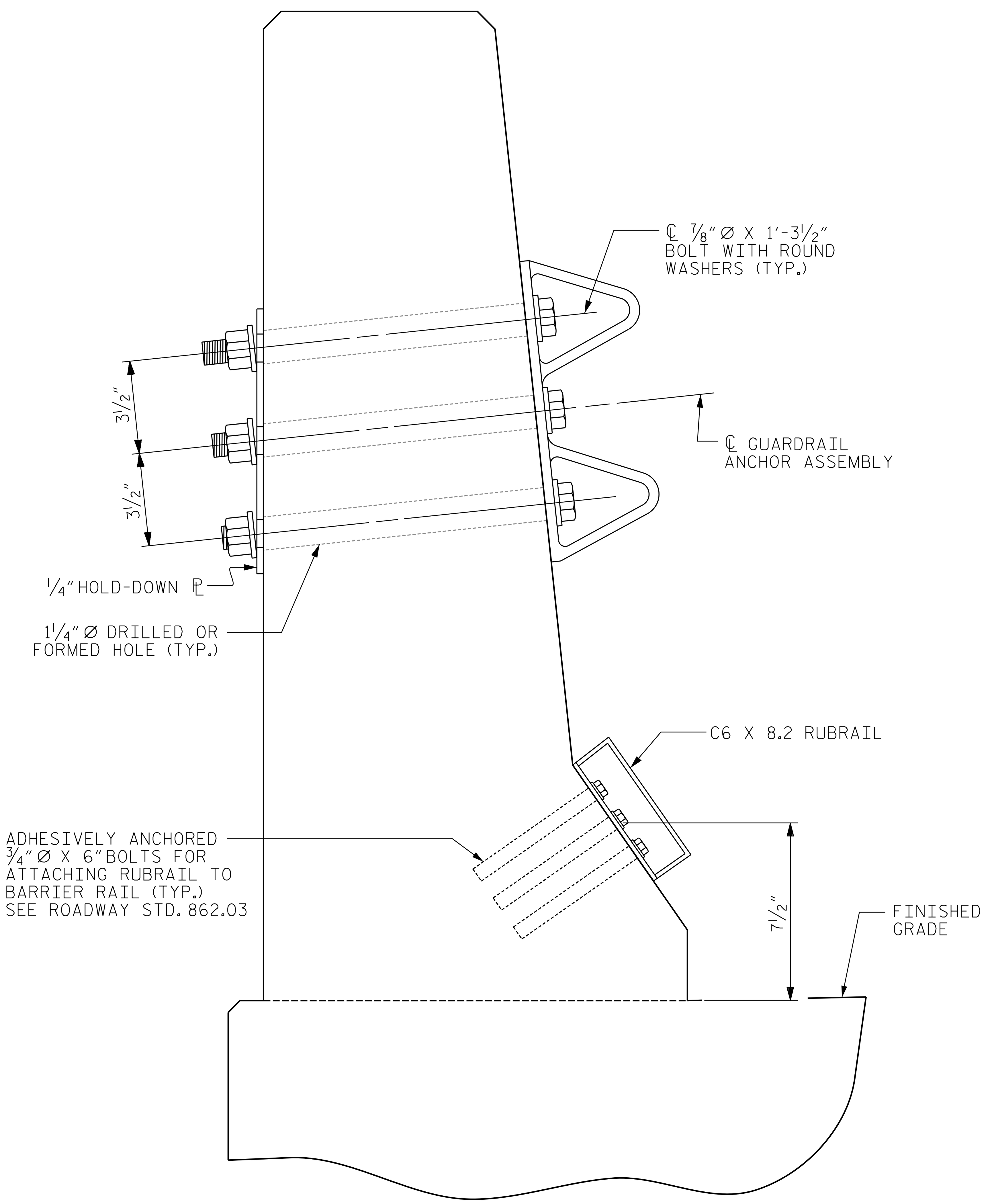
THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

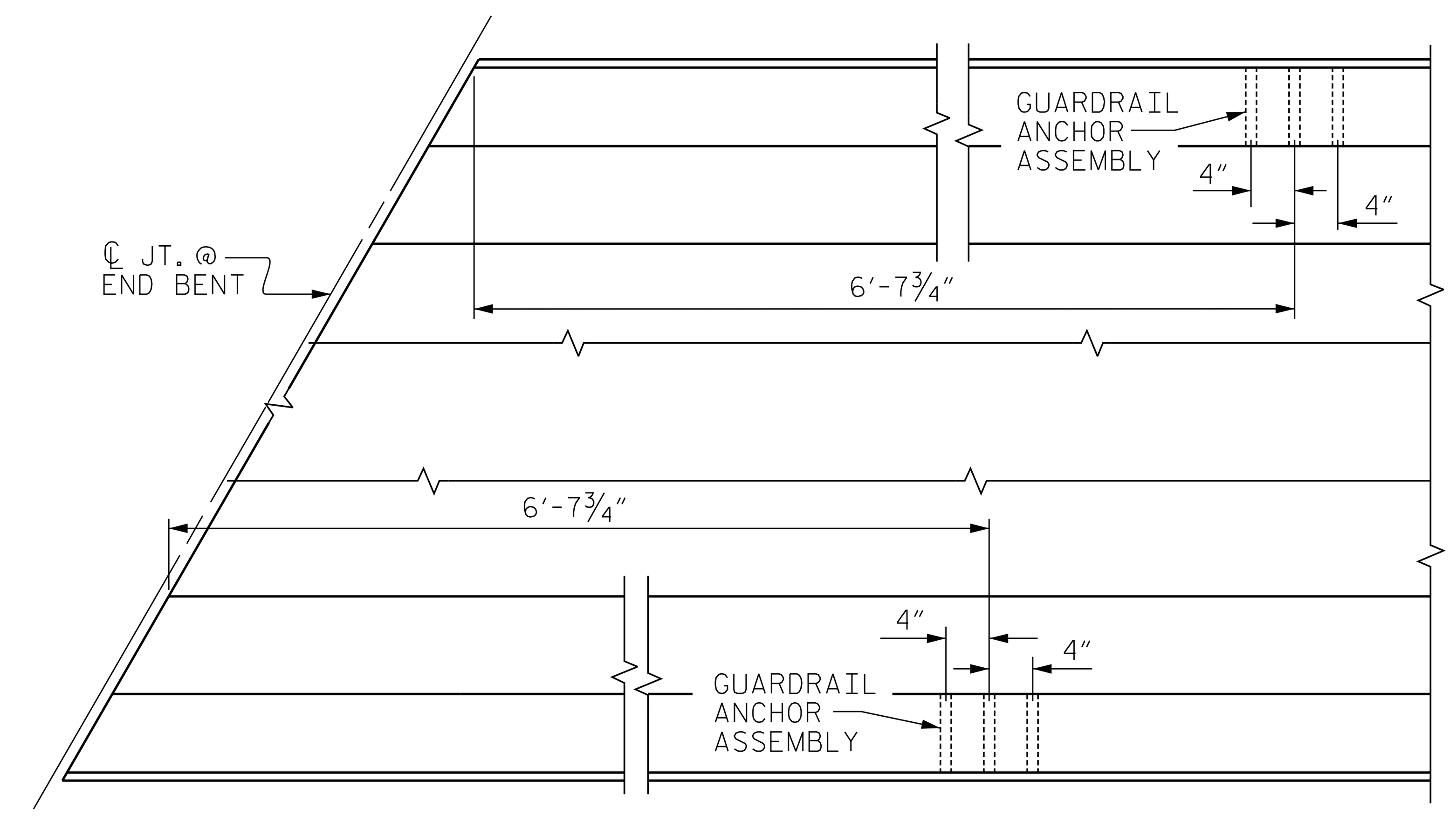
THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE 3/4" Ø X 6" BOLTS WITH WASHERS. LEVEL ONE FIELD TESTING IS REQUIRED, AND THE YIELD LOAD OF THE 3/4" Ø BOLT IS 12 KIPS. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE STANDARD SPECIFICATIONS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.



SECTION E-E

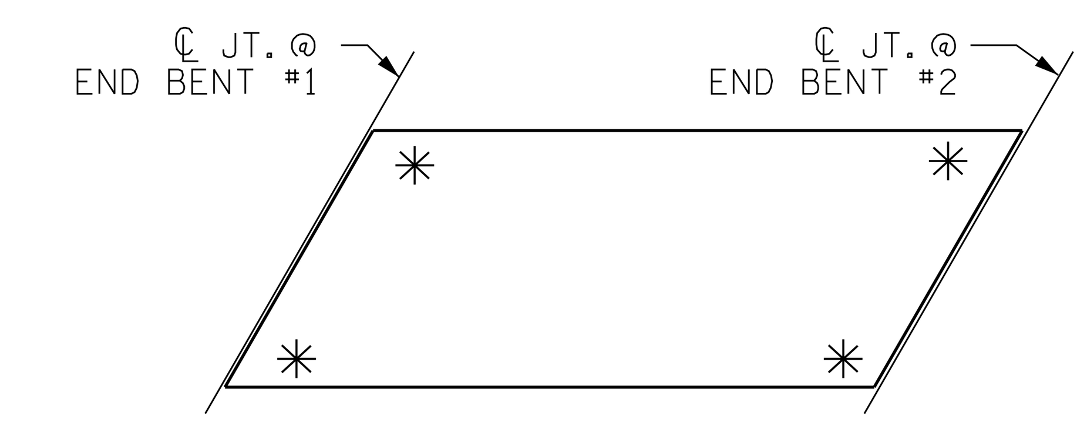
GUARDRAIL ANCHOR ASSEMBLY DETAILS



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Boone, NC 828-355-9933; Tri-Cities, TN 423-467-8401; Knoxville, TN 865-546-5800; Spartanburg, SC 864-574-4775; Charleston, SC 843-974-5650; Middlesboro, KY 606-248-6600; Atlanta, GA 770-627-3590; Raleigh, NC 919-977-9455; Charlotte, NC 704-357-0488

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- = 13+14.02 -SBL-; 29+02.29 -L- = 12+70.38 -NBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

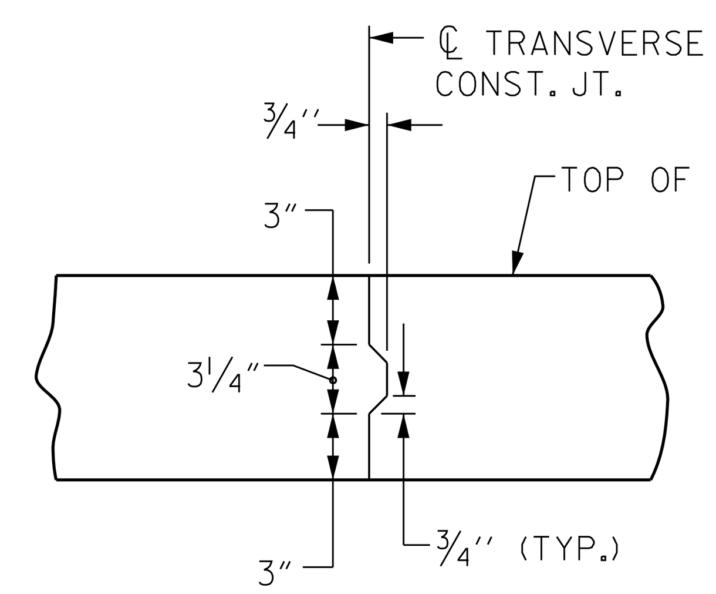
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-19
1			3			TOTAL SHEETS
2			4			31

STD. NO. GRA2

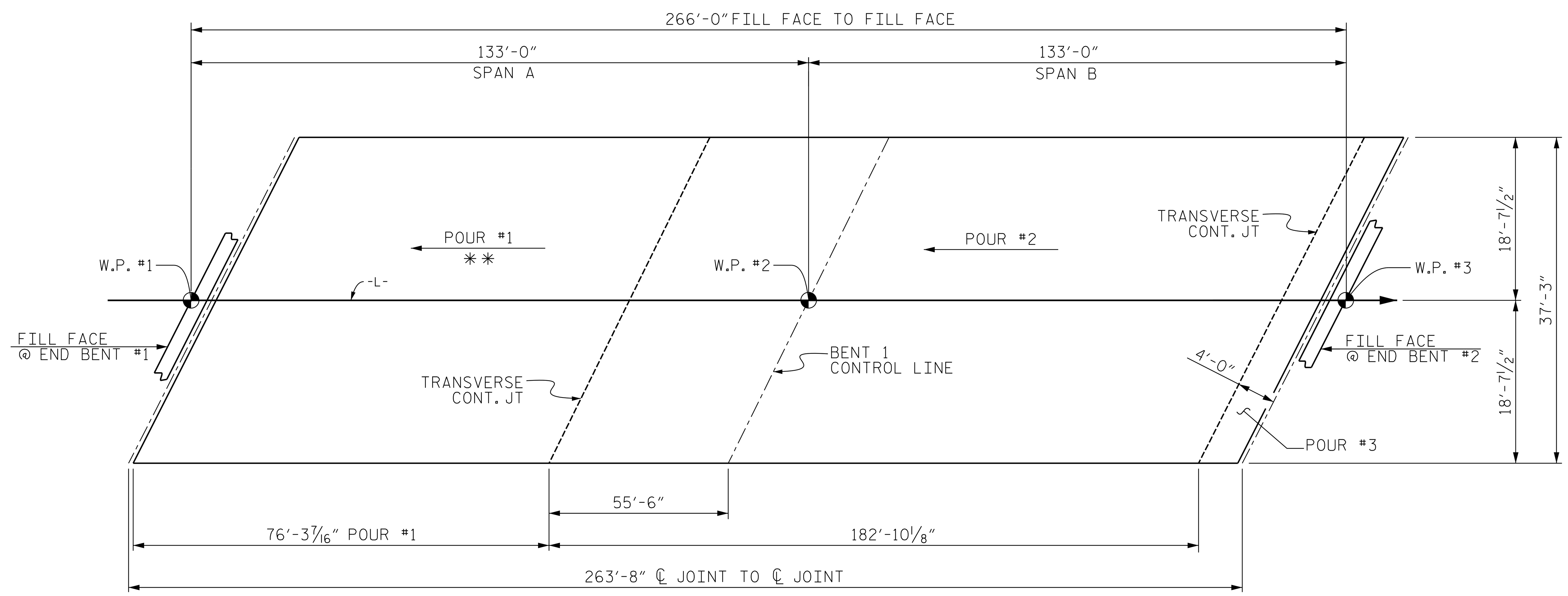
ASSEMBLED BY : WDC	DATE : 08/2019
CHECKED BY : PRG	DATE : 12-2019
DRAWN BY : TLA 5/06	REV. 7/12 MAA/GM
CHECKED BY : GM 5/06	REV. 6/13 MAA/GM
	REV. 12/17 MAA/THC

SUPERSTRUCTURE REINFORCING STEEL LENGTHS ARE BASED ON THE FOLLOWING MINIMUM SPLICE LENGTHS					
BAR SIZE	SUPERSTRUCTURE EXCEPT APPROACH SLABS, PARAPET, AND BARRIER RAIL		APPROACH SLABS		PARAPET AND BARRIER
	EPOXY COATED	UNCOATED	EPOXY COATED	UNCOATED	
#4	1′-11″	1′-7″	1′-11″	1′-7″	2′-6″
#5	2′-5″	2′-0″	2′-5″	2′-0″	3′-1″
#6	2′-10″	2′-5″	3′-7″	2′-5″	3′-8″
#7	4′-2″	2′-9″			
#8	4′-9″	3′-2″			



TRANSVERSE CONSTRUCTION JOINT DETAIL

NOTE: REINFORCING STEEL IN SLAB NOT SHOWN. LONGITUDINAL REINFORCING STEEL SHALL BE CONTINUOUS THRU JOINT.



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FT. = 9,822)

✱✱ IF THE CONTRACTOR CHOOSES TO REVERSE THE DIRECTION OF POUR #1, A CONSTRUCTION JOINT WILL BE REQUIRED 4′-0″ FROM THE JOINT.

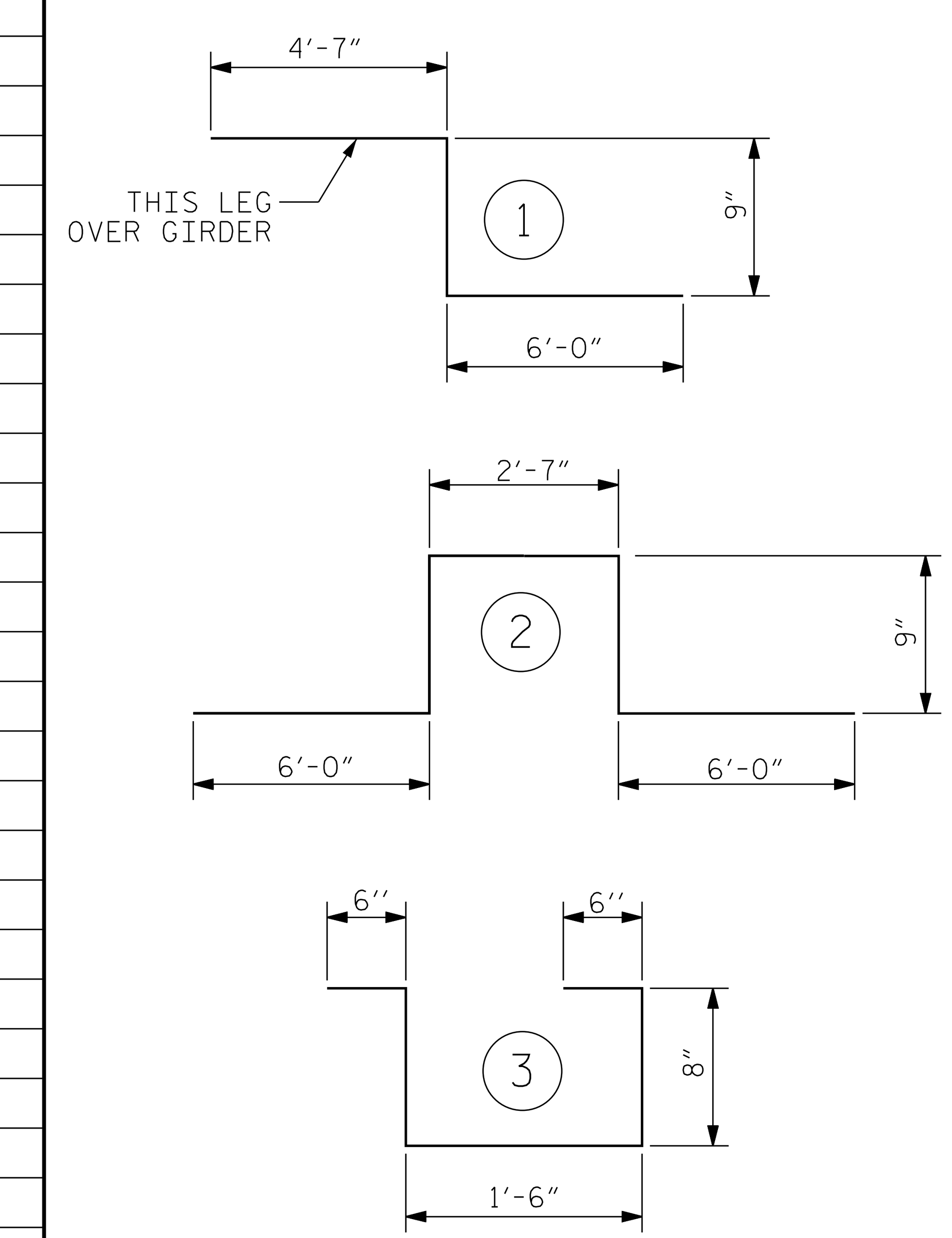
ASSEMBLED BY : AW	DATE : 8/2019
CHECKED BY : PRG	DATE : 8/2019
DRAWN BY : JMB 5/87	REV. 5/1/06 TLA/GM REV. 10/1/11 MAA/GM REV. 12/17 MAA/THC

BILL OF MATERIAL

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT	BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✱ A1	488	#5	STR.	36′-11″	18,790						
A2	488	#5	STR.	36′-11″	18,790						
✱ A101	2	#5	STR.	36′-9″	77	A201	2	#5	STR.	36′-9″	77
✱ A102	2	#5	STR.	35′-9″	75	A202	2	#5	STR.	35′-9″	75
✱ A103	2	#5	STR.	34′-10″	73	A203	2	#5	STR.	34′-10″	73
✱ A104	2	#5	STR.	33′-10″	71	A204	2	#5	STR.	33′-10″	71
✱ A105	2	#5	STR.	32′-10″	68	A205	2	#5	STR.	32′-10″	68
✱ A106	2	#5	STR.	31′-10″	66	A206	2	#5	STR.	31′-10″	66
✱ A107	2	#5	STR.	30′-11″	64	A207	2	#5	STR.	30′-11″	64
✱ A108	2	#5	STR.	29′-11″	62	A208	2	#5	STR.	29′-11″	62
✱ A109	2	#5	STR.	28′-11″	60	A209	2	#5	STR.	28′-11″	60
✱ A110	2	#5	STR.	27′-11″	58	A210	2	#5	STR.	27′-11″	58
✱ A111	2	#5	STR.	26′-11″	56	A211	2	#5	STR.	26′-11″	56
✱ A112	2	#5	STR.	26′-0″	54	A212	2	#5	STR.	26′-0″	54
✱ A113	2	#5	STR.	25′-0″	52	A213	2	#5	STR.	25′-0″	52
✱ A114	2	#5	STR.	24′-0″	50	A214	2	#5	STR.	24′-0″	50
✱ A115	2	#5	STR.	23′-0″	48	A215	2	#5	STR.	23′-0″	48
✱ A116	2	#5	STR.	22′-1″	46	A216	2	#5	STR.	22′-1″	46
✱ A117	2	#5	STR.	21′-1″	44	A217	2	#5	STR.	21′-1″	44
✱ A118	2	#5	STR.	20′-1″	42	A218	2	#5	STR.	20′-1″	42
✱ A119	2	#5	STR.	19′-1″	40	A219	2	#5	STR.	19′-1″	40
✱ A120	2	#5	STR.	18′-1″	38	A220	2	#5	STR.	18′-1″	38
✱ A121	2	#5	STR.	17′-2″	36	A221	2	#5	STR.	17′-2″	36
✱ A122	2	#5	STR.	16′-2″	34	A222	2	#5	STR.	16′-2″	34
✱ A123	2	#5	STR.	15′-2″	32	A223	2	#5	STR.	15′-2″	32
✱ A124	2	#5	STR.	14′-2″	30	A224	2	#5	STR.	14′-2″	30
✱ A125	2	#5	STR.	13′-3″	28	A225	2	#5	STR.	13′-3″	28
✱ A126	2	#5	STR.	12′-3″	26	A226	2	#5	STR.	12′-3″	26
✱ A127	2	#5	STR.	11′-3″	23	A227	2	#5	STR.	11′-3″	23
✱ A128	2	#5	STR.	10′-3″	21	A228	2	#5	STR.	10′-3″	21
✱ A129	2	#5	STR.	9′-4″	19	A229	2	#5	STR.	9′-4″	19
✱ A130	2	#5	STR.	8′-4″	17	A230	2	#5	STR.	8′-4″	17
✱ A131	2	#5	STR.	7′-4″	15	A231	2	#5	STR.	7′-4″	15
✱ A132	2	#5	STR.	6′-4″	13	A232	2	#5	STR.	6′-4″	13
✱ A133	2	#5	STR.	5′-4″	11	A233	2	#5	STR.	5′-4″	11
✱ A134	2	#5	STR.	4′-5″	9	A234	2	#5	STR.	4′-5″	9
✱ A135	2	#5	STR.	3′-5″	7	A235	2	#5	STR.	3′-5″	7
✱ A136	2	#5	STR.	2′-5″	5	A236	2	#5	STR.	2′-5″	5
✱ G1	4	#5	STR.	22′-0″	92	B1	210	#5	STR.	54′-8″	11,974
						✱ B2	156	#5	STR.	44′-6″	7,241
✱ K1	8	#5	1	11′-4″	95	✱ B3	78	#6	STR.	46′-6″	5,448
✱ K2	8	#5	2	16′-1″	134	✱ B4	36	#6	STR.	40′-0″	2,163
✱ S1	60	#4	3	3′-10″	154	REINFORCING STEEL					32,234 LBS
						✱ EPOXY COATED REINFORCING STEEL					35,586 LBS

GROOVING BRIDGE FLOORS	
APPROACH SLABS	889 SQ.FT.
BRIDGE DECK	8129
TOTAL	9018 SQ.FT.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

	CLASS AA CONCRETE	REINFORCING STEEL	EPOXY COATED REINFORCING STEEL
	(CU.YDS.)	(LBS.)	(LBS.)
POUR 1	94.9		
POUR 2	227.2		
POUR 3	5.6		
TOTALS✱✱	327.7	32,234	35,586

✱✱ QUANTITIES FOR BARRIER RAIL ARE NOT INCLUDED

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-= 13+14.02 -SBL- 29+02.29 -L-= 12+70.38 -NBL-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

V&M Vaughn & Melton Consulting Engineers Asheville, North Carolina 828-253-2796

Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488 · Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3509

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

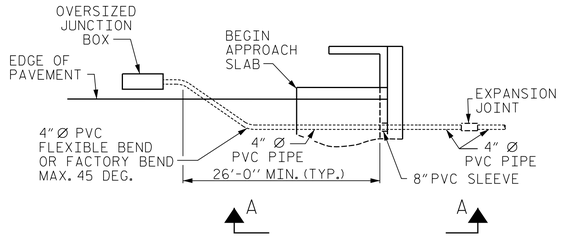
STANDARD

SUPERSTRUCTURE

BILL OF MATERIAL

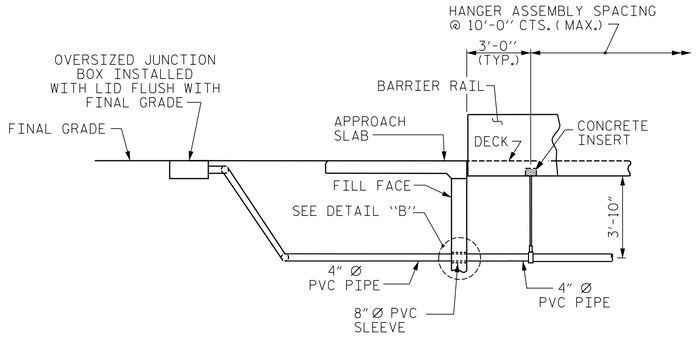
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-20
1			3			TOTAL SHEETS
2			4			31

STD. NO. BOM1

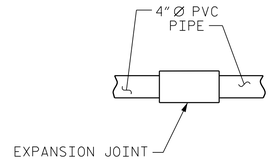


DETAIL "A"

TERMINATION OF CONDUIT AT WING WALL
END BENT 1 SHOWN, END BENT 2 SIMILAR



VIEW A-A



EXPANSION JOINT FITTING

NOTES

THE INSTALLATION OF THE CONDUIT SYSTEM SHALL BE PAID FOR AS LINEAR FEET. THE PRICE SHALL INCLUDE ALL CONDUIT, HANGERS, STABILIZERS, EXPANSION JOINTS, CONCRETE INSERTS, PVC SLEEVES AND ALL NECESSARY HARDWARE TO COMPLETE THE WORK.

THE CONTRACTOR SHALL FIELD VERIFY THAT THE CONDUIT SYSTEM IS NOT IN CONFLICT WITH THE GUARDRAIL POST.

SEE DETAIL "C" FOR HANGER ASSEMBLY INSTALLATION.

INSTALL SLEEVES PARALLEL TO GIRDERS. SEE DETAIL "B" FOR SLEEVE INSTALLATION.

INSTALL STABILIZERS MIDWAY BETWEEN DECK EXPANSIONS JOINTS STABILIZER CAN NOT BE INSTEAD OF A HANGER ASSEMBLY.

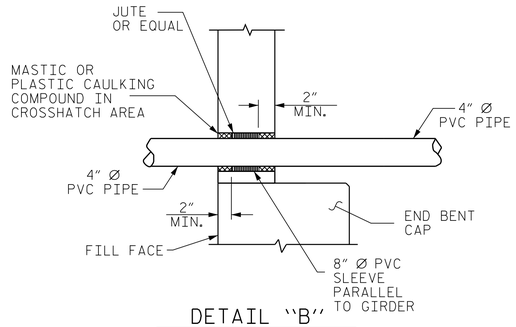
INSTALL EXPANSION JOINTS AT EACH END BENT.

THE CONCRETE SCREW INSERT SHALL HAVE A ROD SIZE OF 5/8" AND A PULL FORCE OF 1260 lbs.

FOR FIBER OPTIC CONDUIT SYSTEM WITH HANGERS, SEE SPECIAL PROVISIONS.

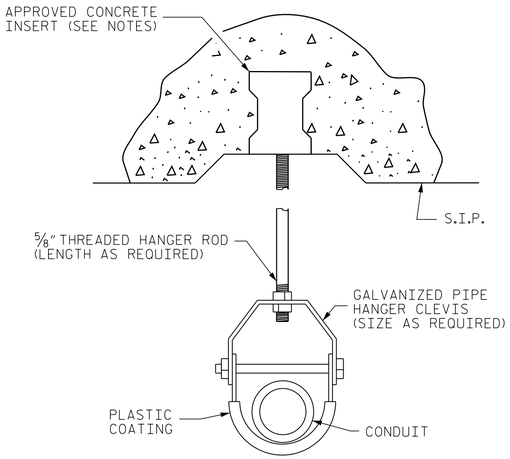
PVC PIPE AND COUPLINGS SHALL BE SCHEDULE 80.

FOR OVERSIZE JUNCTION BOX, SEE STANDARD SPECIFICATION 1098-5.



DETAIL "B"

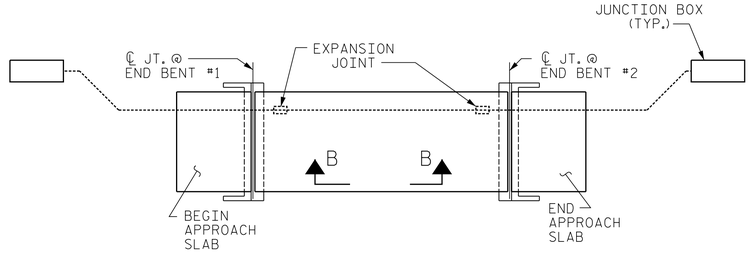
PVC SLEEVE INSTALLATION



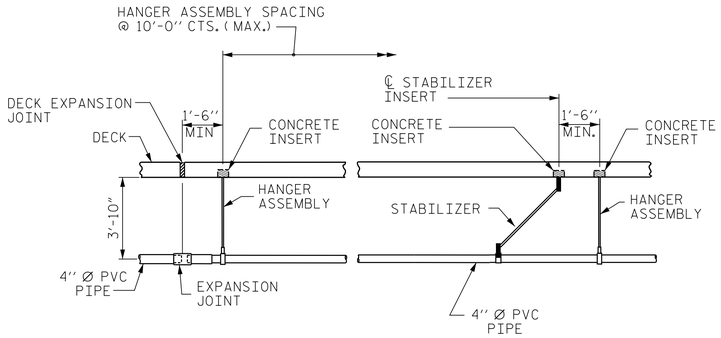
DETAIL "C"

HANGER ASSEMBLY

PAY LENGTH = 294 LINEAR FEET

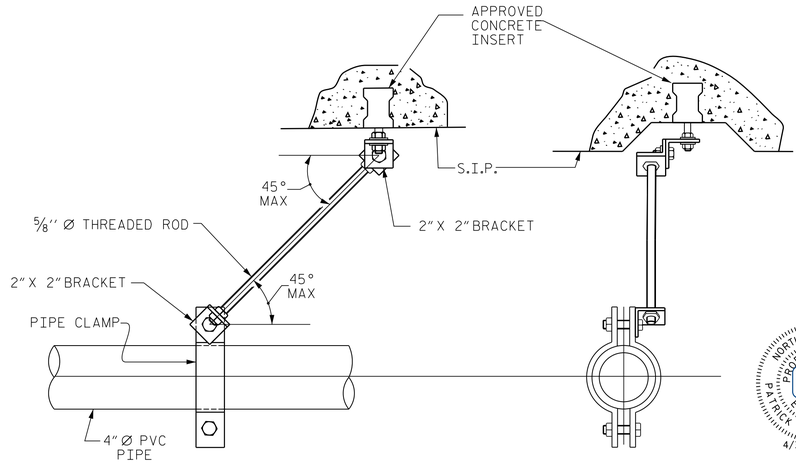


CONDUIT LAYOUT



VIEW B-B

STEEL OR CONCRETE GIRDERS



DETAIL "E"

STABILIZER

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
Middlesboro, KY 606-248-6600
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PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-=
13+14.02 -SBL-
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12+70.38 -NBL-

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

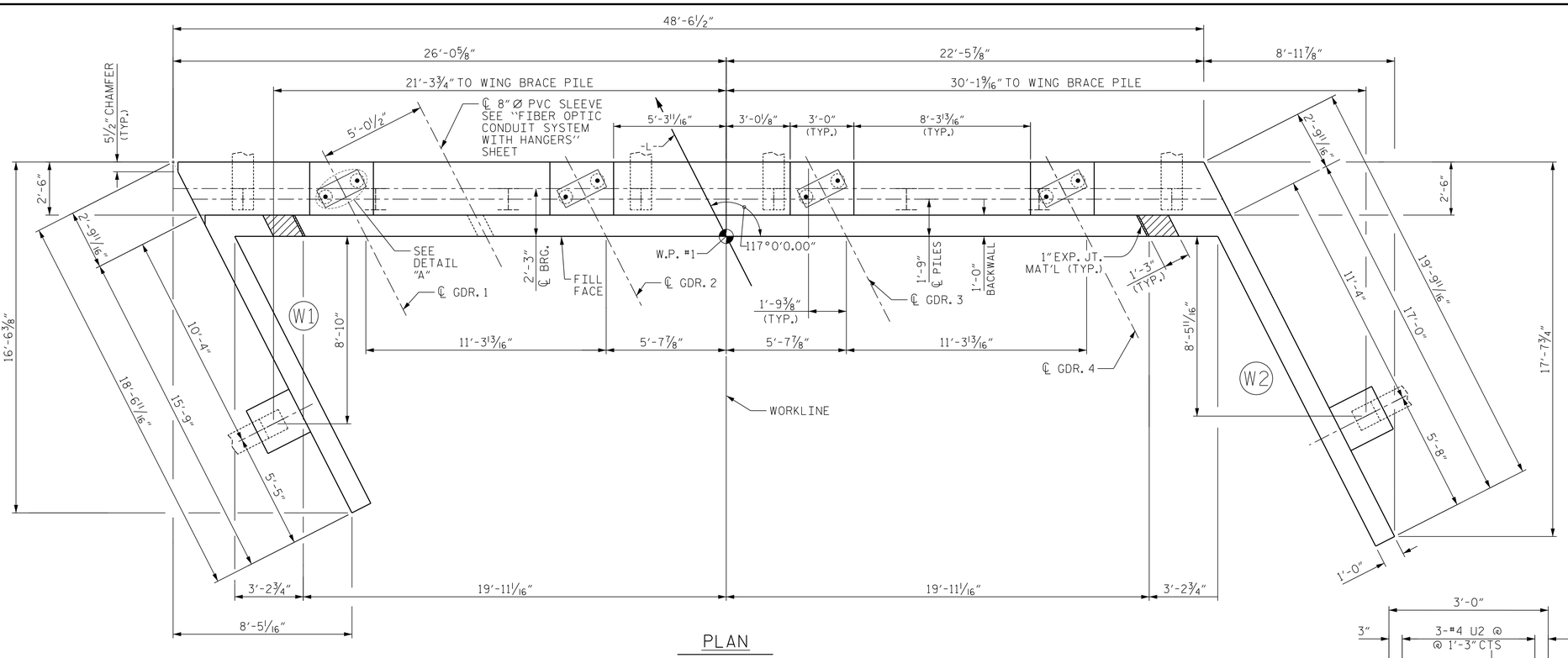
FIBER OPTIC CONDUIT SYSTEM WITH HANGERS

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

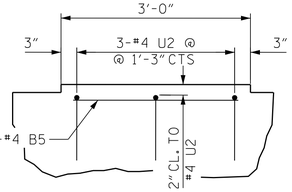
DRAWN BY : WDC DATE : 3-20
CHECKED BY : PRG DATE : 3-20
DESIGN ENGINEER OF RECORD: PRG DATE : 3-20

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-20a
1			3			TOTAL SHEETS
2			4			31

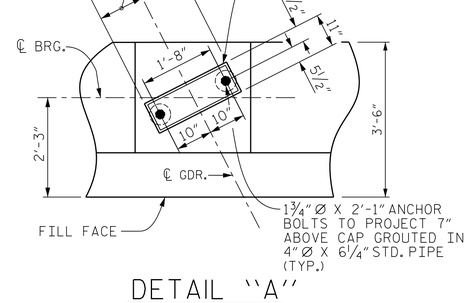


PLAN



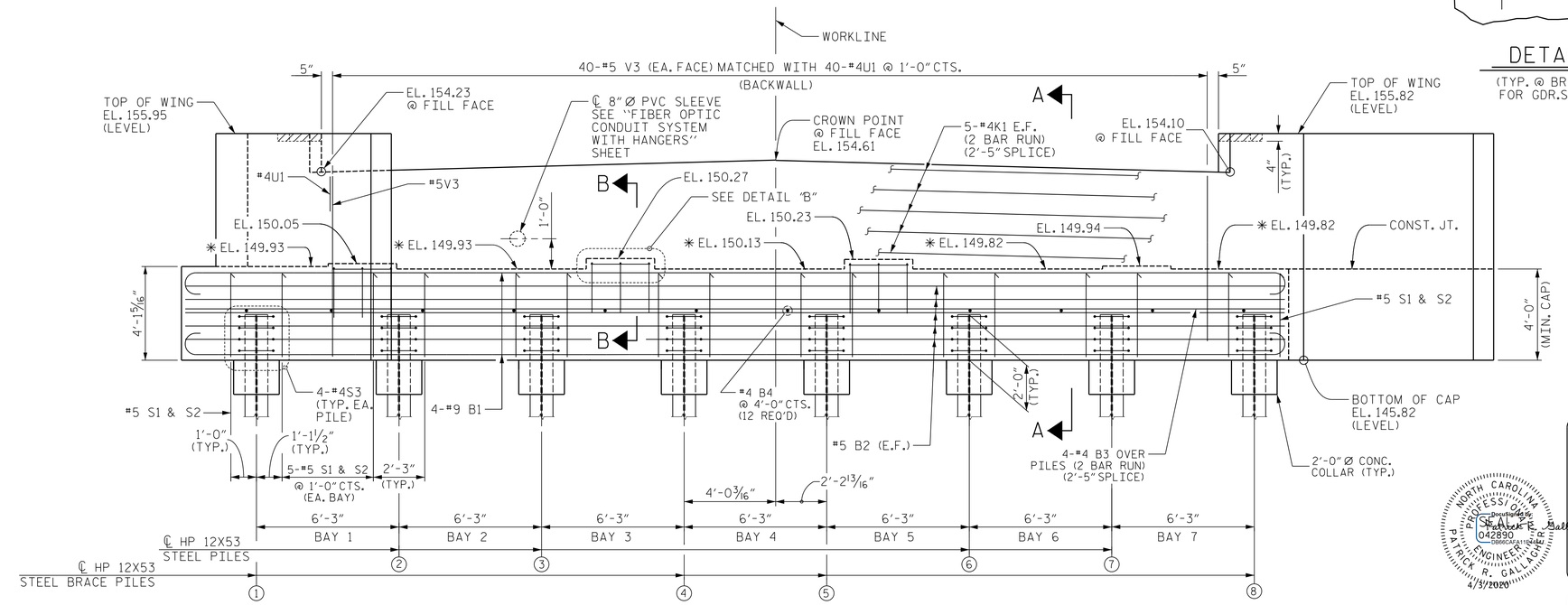
DETAIL "B"

(TYP. @ BRIDGE SEAT FOR GDR.S 1, 2, & 3)



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH GIRDER)



ELEVATION

WING BRACE PILES NOT SHOWN FOR CLARITY

NOTES

STIRRUPS IN CAPS MAY BE SHIFIED AS NECCESSARY TO CLEAR ANCHOR BOLTS.

FOR PIPE INSERT DETAILS. SEE BEARING SHEET.

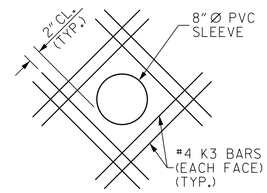
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

* THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%

THE TOP SURFACE AREAS OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



CONDUIT THRU BACKWALL DETAIL

THE 8" Ø PVC SLEEVE SHALL BE LOCATED BY THE ENGINEER

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 1 OF 3

V&M
Vaughn & Melton
Consulting Engineers
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Knoxville, TN 865-546-5800
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Charlotte, NC 704-357-0488

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
4/3/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT No. 1

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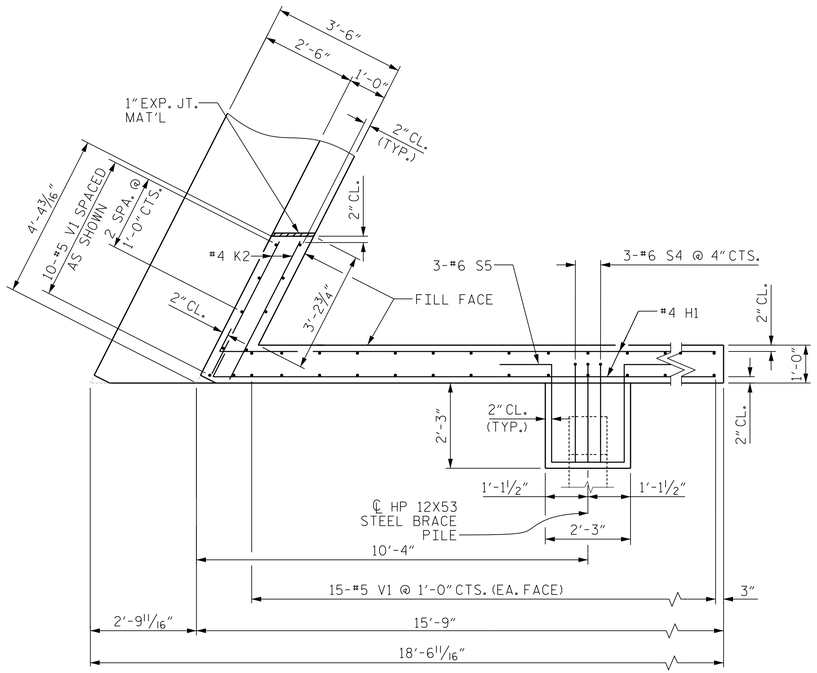
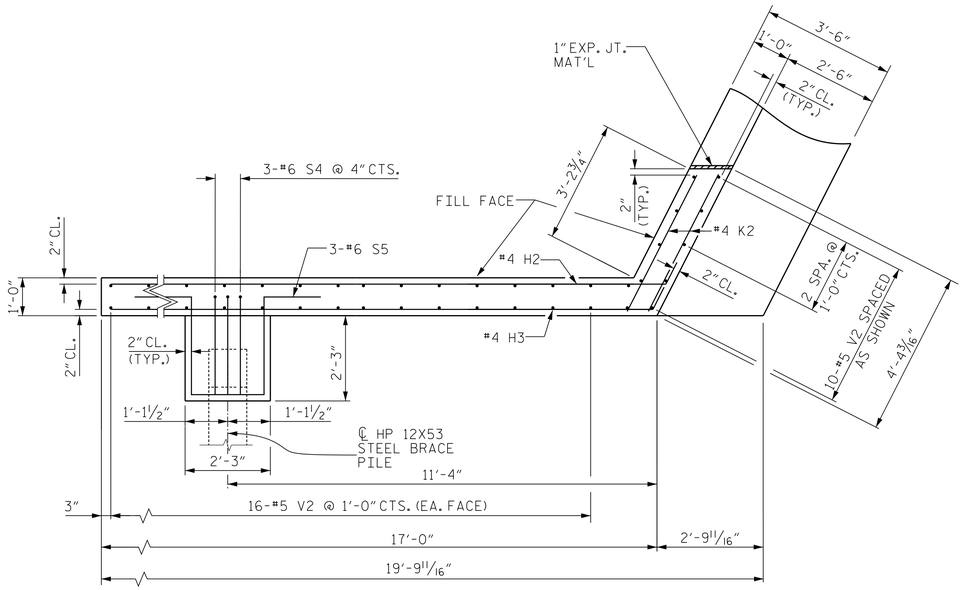
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-21
1			3			TOTAL SHEETS
2			4			31

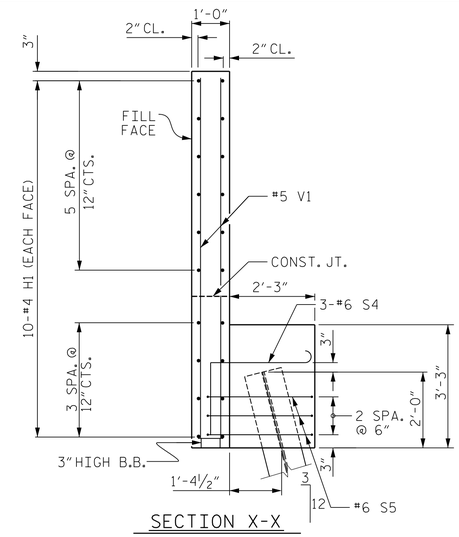
V & M PROJECT NO.: 31748-42



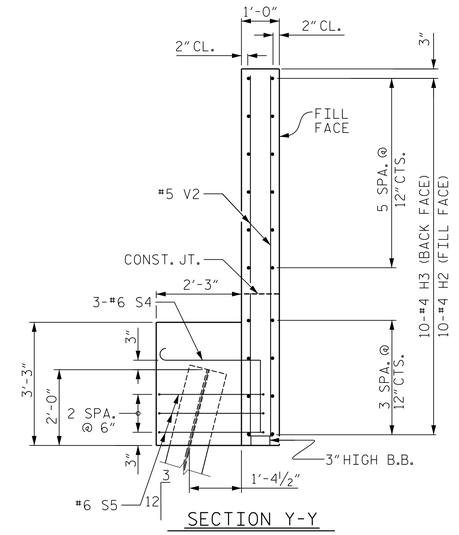
PLAN OF WING (W1)



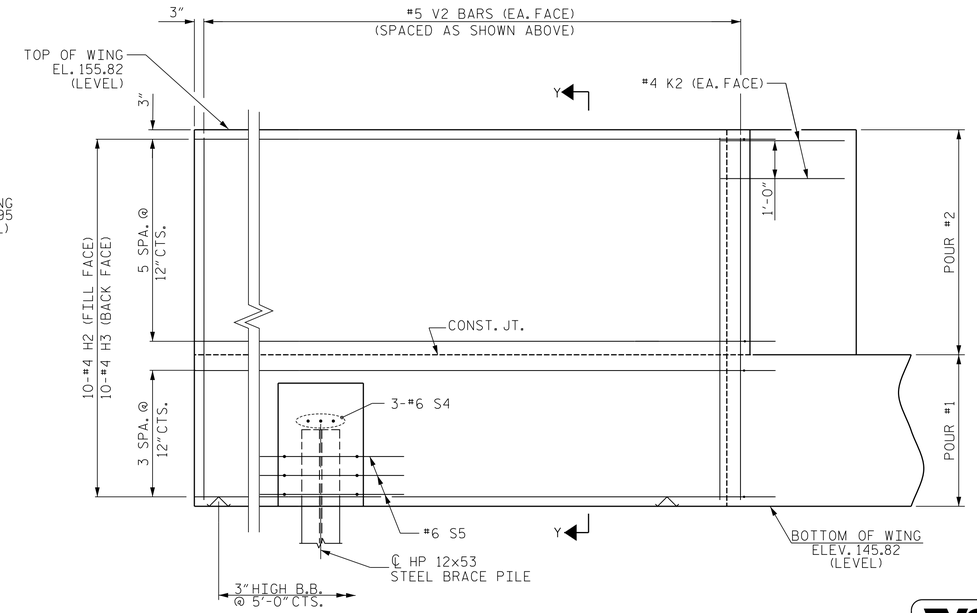
PLAN OF WING (W2)



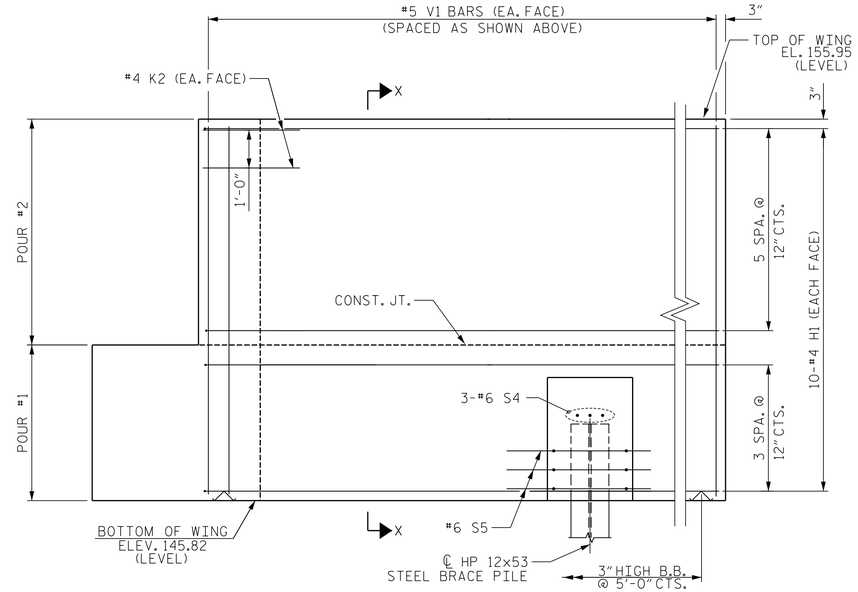
SECTION X-X



SECTION Y-Y



ELEVATION OF WING (W2)



ELEVATION OF WING (W1)

V & M PROJECT NO.: 31748-42

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

SEALED Douglas Allen Patrick Ryan Gallagher

SHEET 2 OF 3

Vaughn & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796
Boone, NC 828-355-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1

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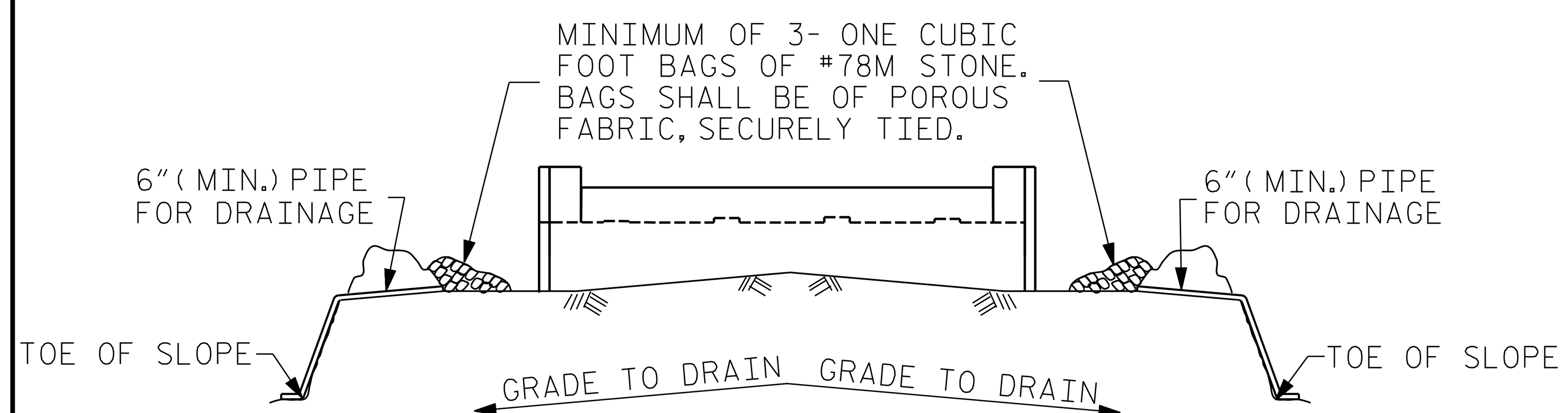
1			3			TOTAL SHEETS
2			4			31

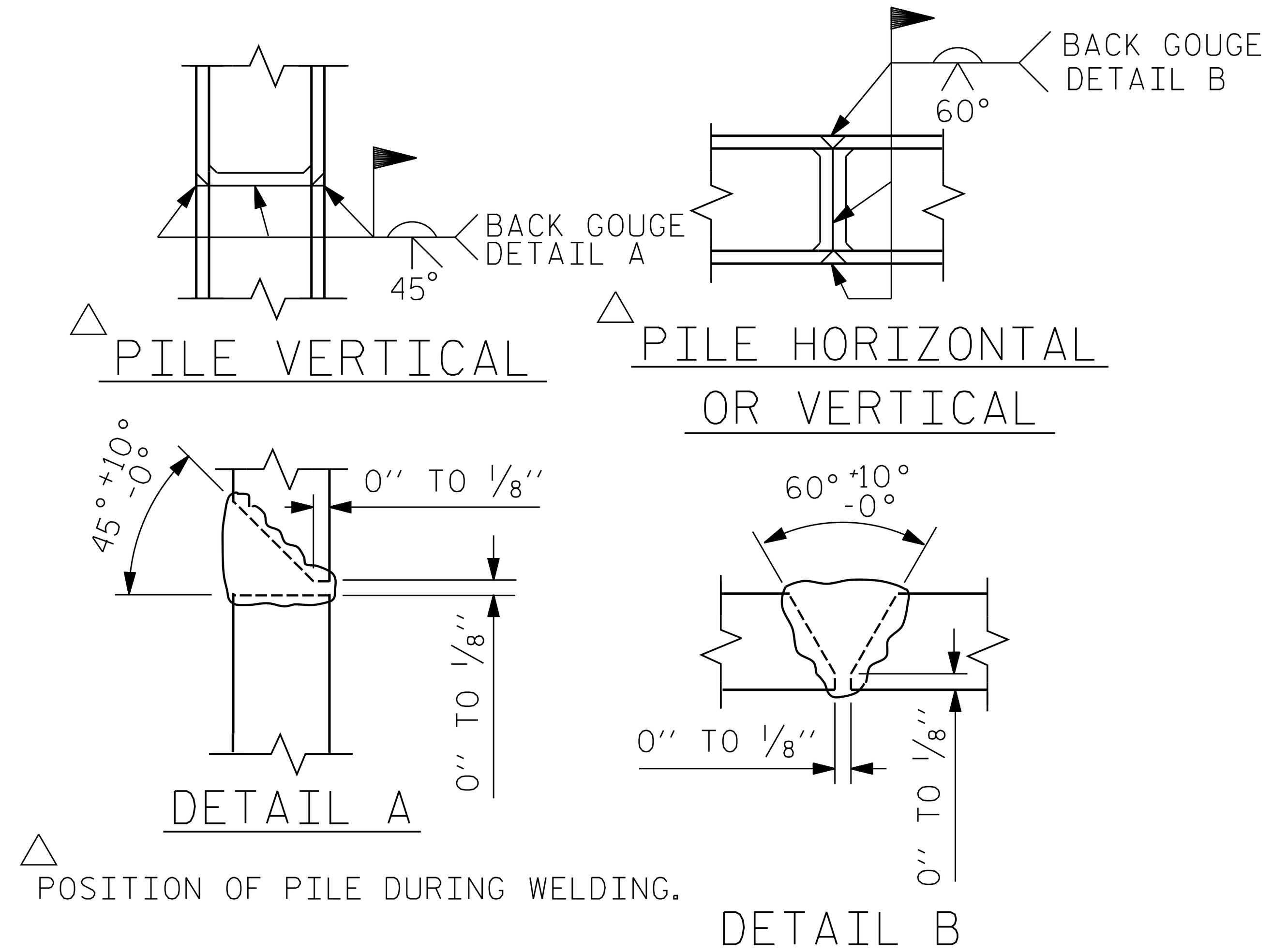


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

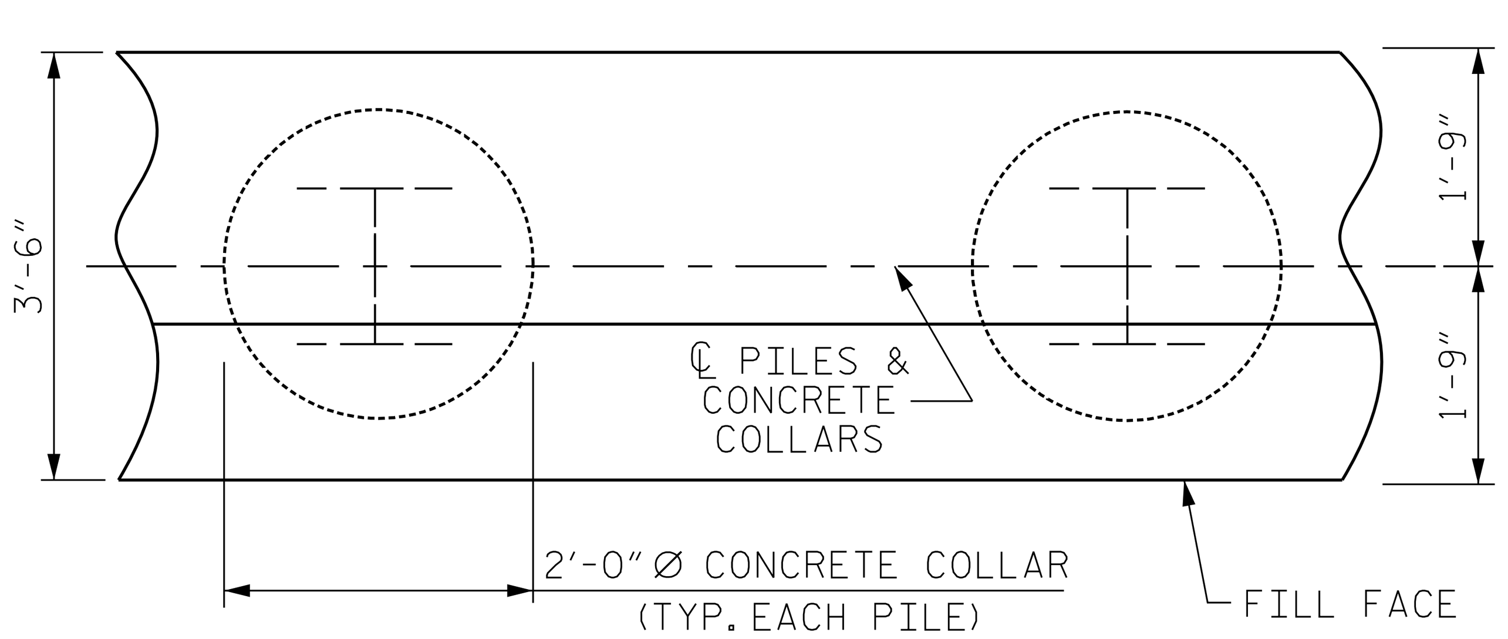
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

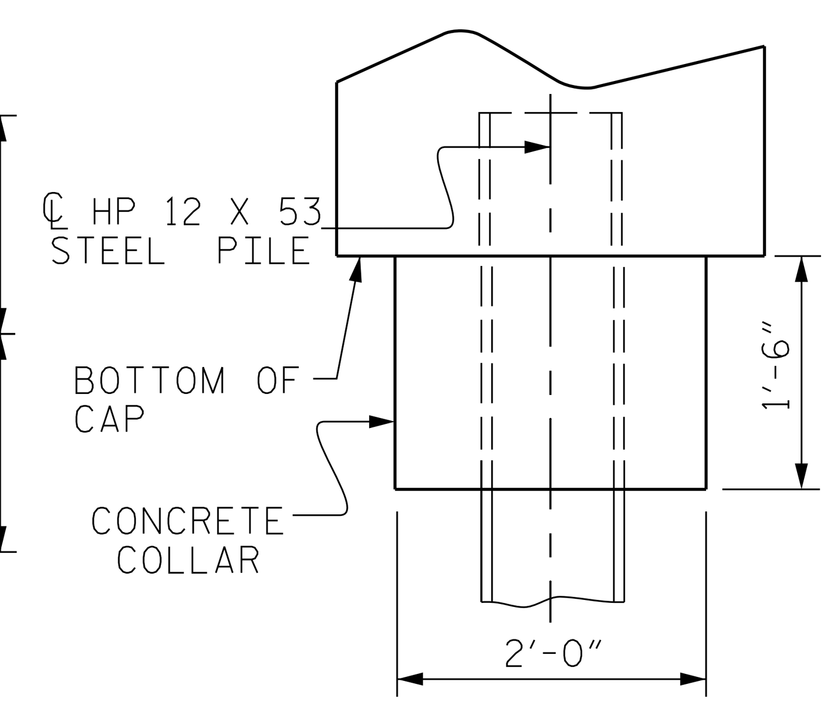
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



PILE SPLICE DETAILS



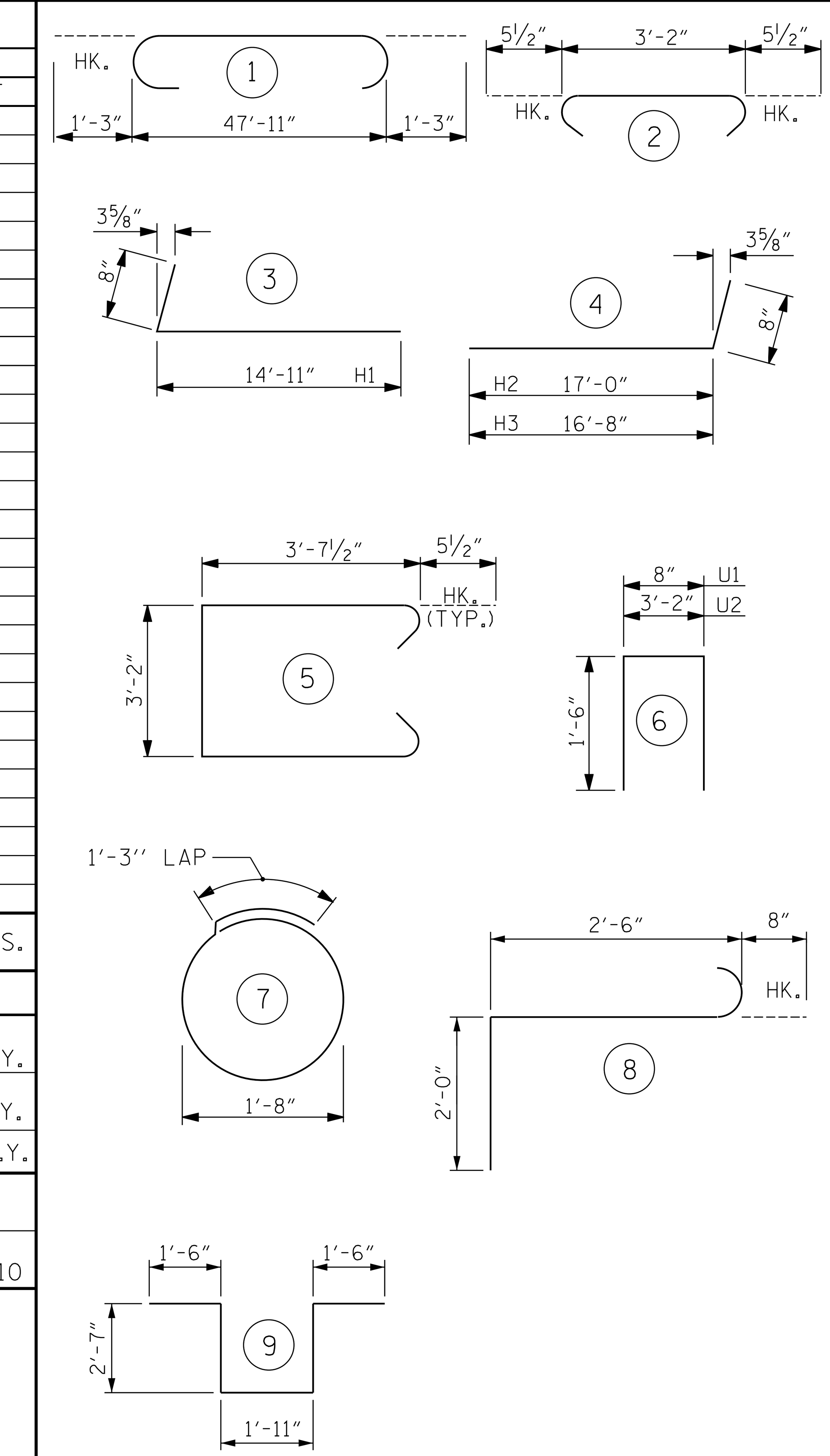


CORROSION PROTECTION FOR STEEL PILES DETAIL

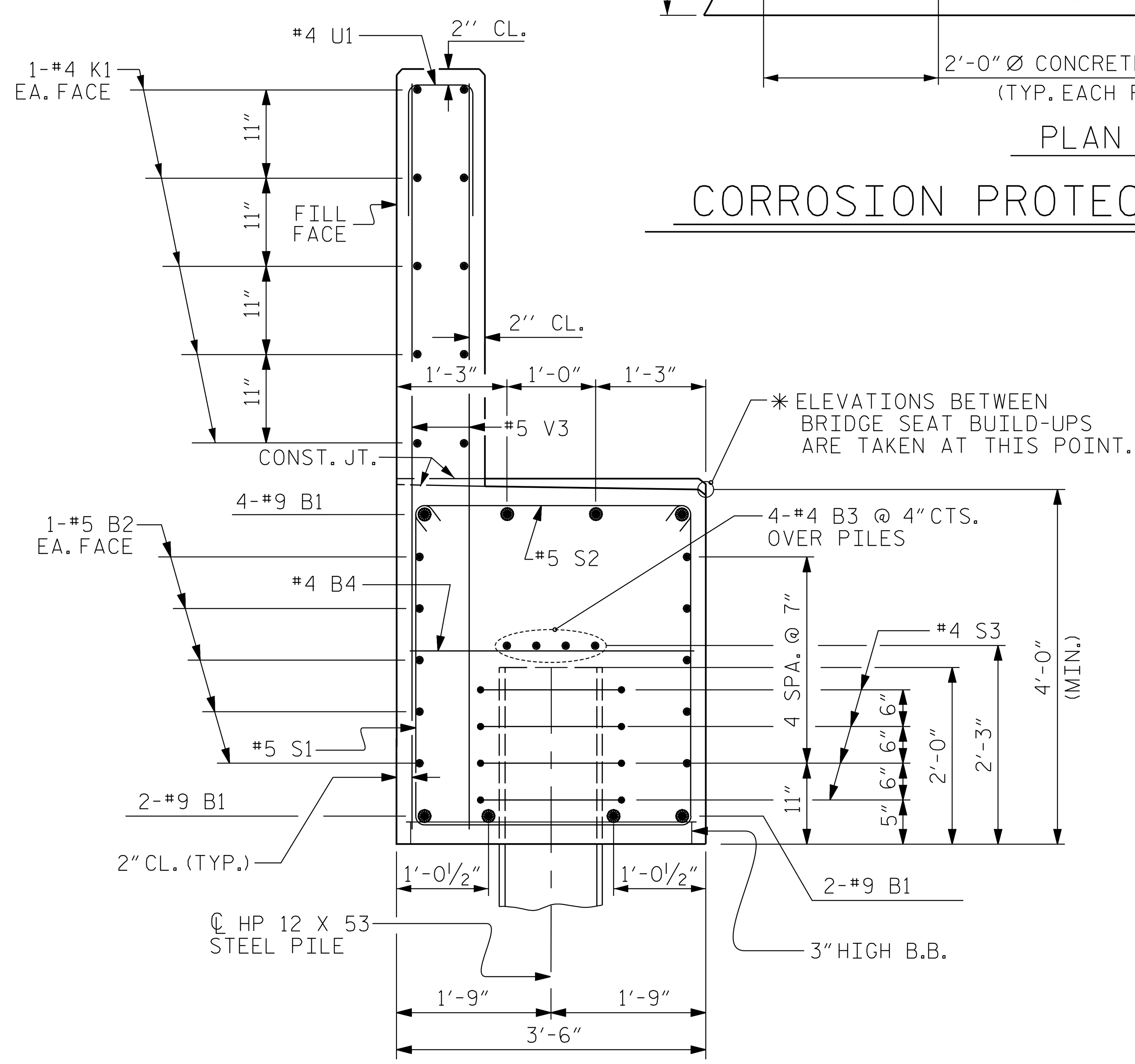
BILL OF MATERIAL					
END BENT 1					
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'-5"	1371
B2	10	#5	STR	48'-2"	502
B3	8	#4	STR	25'-4"	135
B4	12	#4	STR	3'-2"	25
B5	12	#4	STR	2'-8"	21
H1	20	#4	3	15'-7"	208
H2	10	#4	4	17'-8"	118
H3	10	#4	4	17'-4"	116
K1	20	#4	STR	25'-4"	338
K2	8	#4	STR	4'-0"	21
K3	16	#4	STR	2'-0"	21
S1	37	#5	5	11'-4"	437
S2	37	#5	2	4'-1"	158
S3	32	#4	7	6'-6"	139
S4	6	#6	8	5'-2"	47
S5	6	#6	9	10'-1"	91
U1	40	#4	6	3'-8"	98
U2	9	#4	6	6'-2"	37
V1	40	#5	STR	9'-8"	403
V2	42	#5	STR	9'-6"	416
V3	80	#5	STR	7'-10"	654
REINFORCING STEEL					5356 LBS.

CLASS A CONCRETE BREAKDOWN	
POUR 1: CAP, BOT OF WINGS, PILE COLLARS	33.4 C.Y.
POUR 2: BACKWALL, UPPER PART OF WINGS	14.9 C.Y.
TOTAL CLASS A CONCRETE	48.3 C.Y.
HP 12 X 53 STEEL PILES NO: 10	LIN. FT. = 420.0
PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES	NO: 10

BAR TYPES

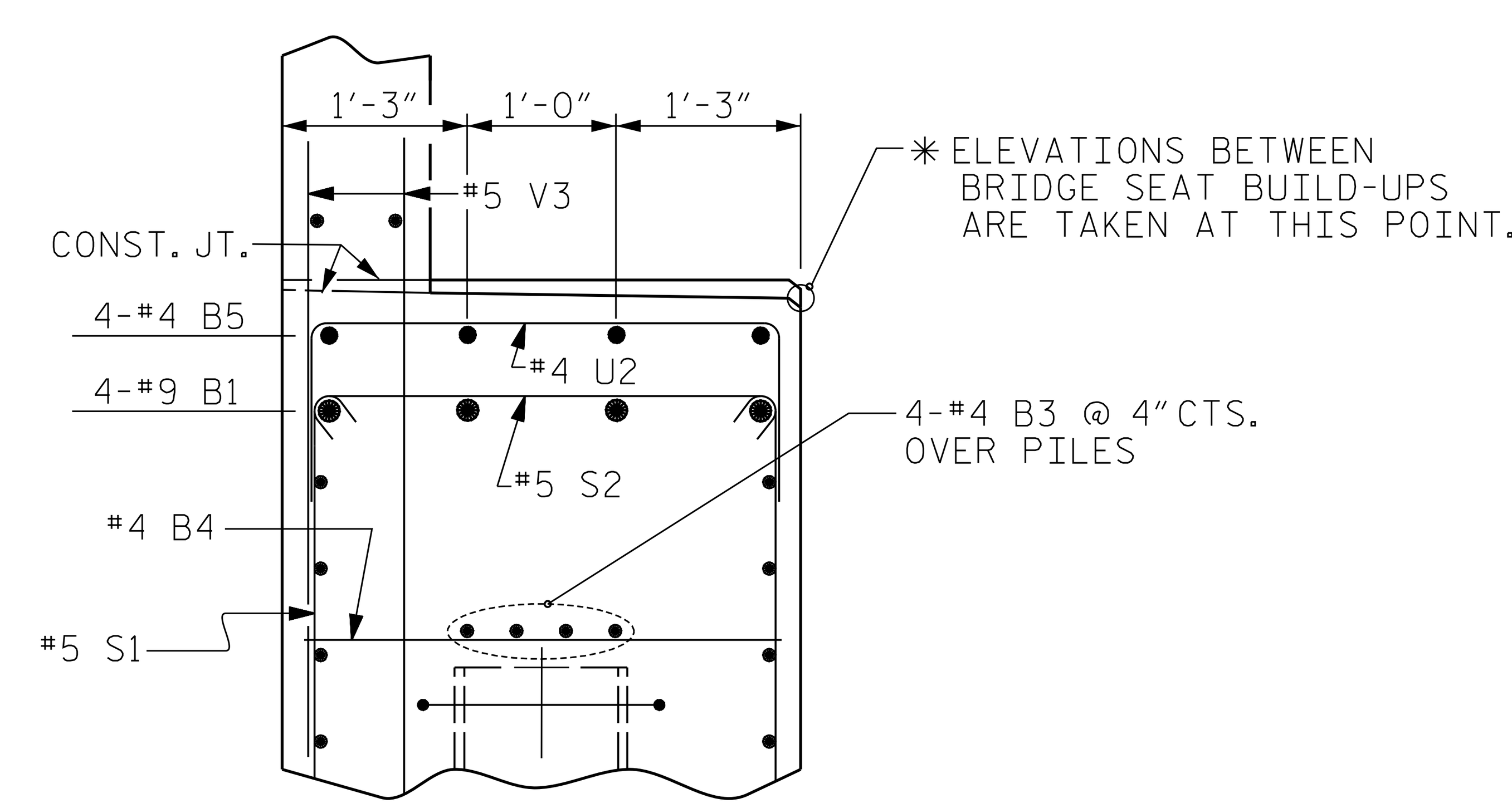


ALL BAR DIMENSIONS ARE OUT TO OUT.



SECTION A-A

(CONCRETE COLLAR NOT SHOWN)



PARTIAL SECTION B-B

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Patrick R. Gallagher
4/3/2020

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- = 13+14.02 -SBL-
29+02.29 -L- = 12+70.38 -NBL-

SHEET 3 OF 3

V&M Vaughn & Melton Consulting Engineers
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 1 DETAILS

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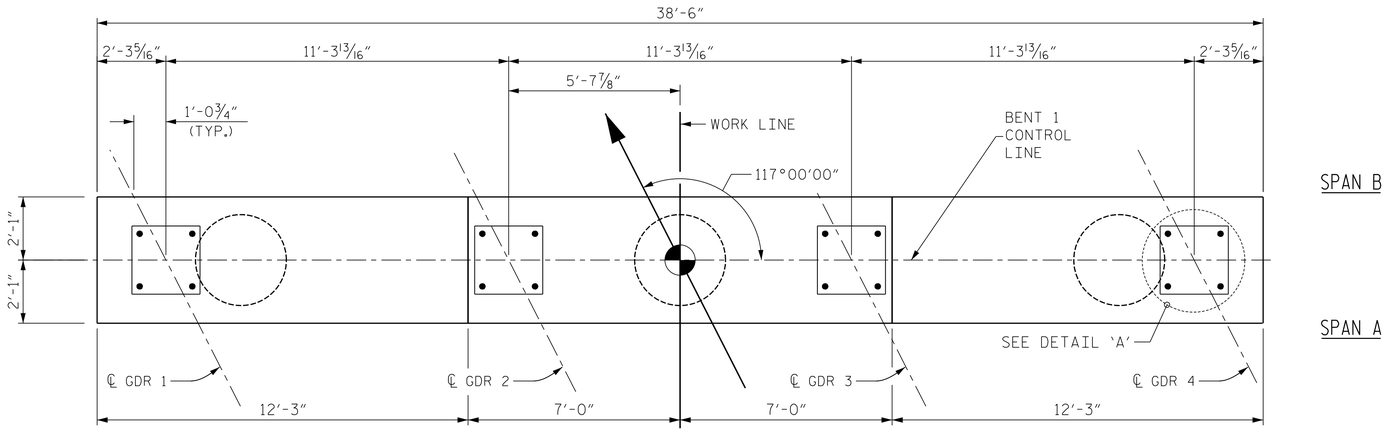
NO.	BY:	DATE:	NO.	BY:	DATE:	SHEET NO.	S1-23
1			3			TOTAL SHEETS	31
2			4				

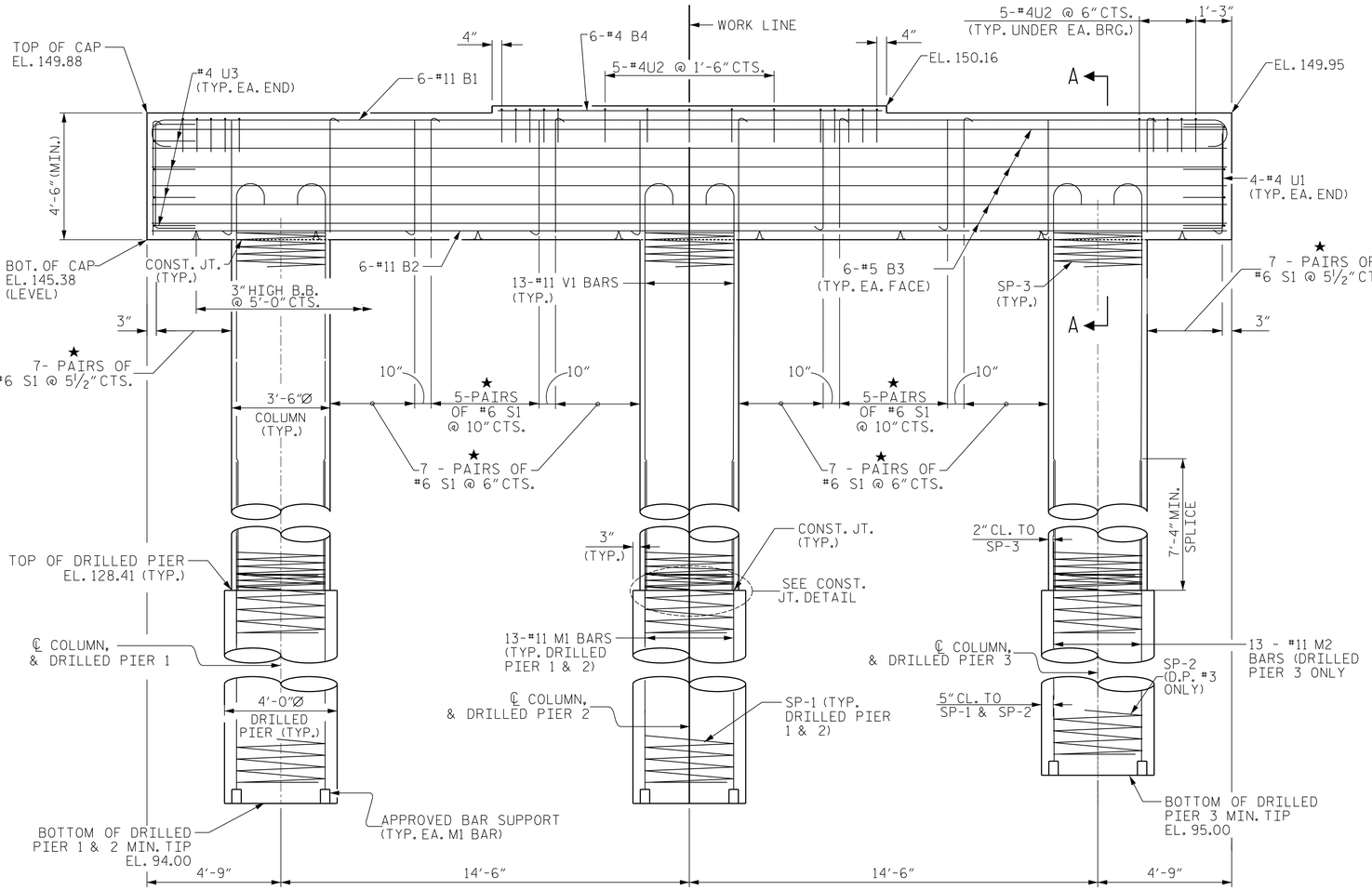
V & M PROJECT NO.: 31748-42



SPAN B

SPAN A

PLAN



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.

HOOKS ON ''V'' BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

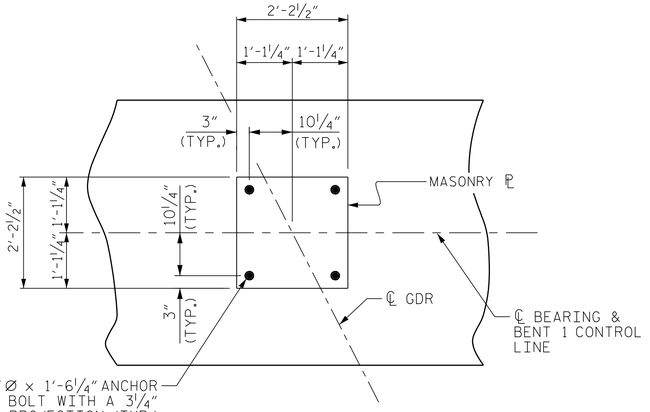
FOR DRILLED PIERS, SEE SECTION 411 OF THE STANDARD SPECIFICATIONS.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR ''REINFORCING STEEL'' AND ''SPIRAL COLUMN REINFORCING STEEL.''

★ INVERT ALTERNATE STIRRUPS.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR DRILLED PIERS IS DETAILED WITH 3 FEET OF EXTRA LENGTH.

THE LOCATION OF THE CONSTRUCTION JOINT IN THE DRILLED PIERS IS BASED ON AN APPROXIMATE GROUND LINE ELEVATION. IF THE CONSTRUCTION JOINT IS ABOVE THE ACTUAL GROUND LINE ELEVATION, THE CONTRACTOR SHALL PLACE THE CONSTRUCTION JOINT 1 FT. BELOW THE GROUND LINE.



DETAIL 'A'

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

Patrick R. Gallagher

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
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SHEET 1 OF 2

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SUBSTRUCTURE

BENT 1

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1			3			TOTAL SHEETS
2			4			31

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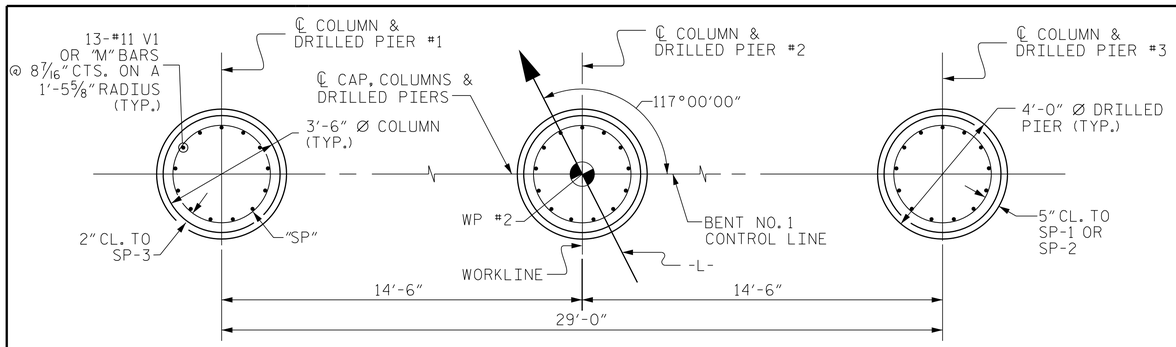
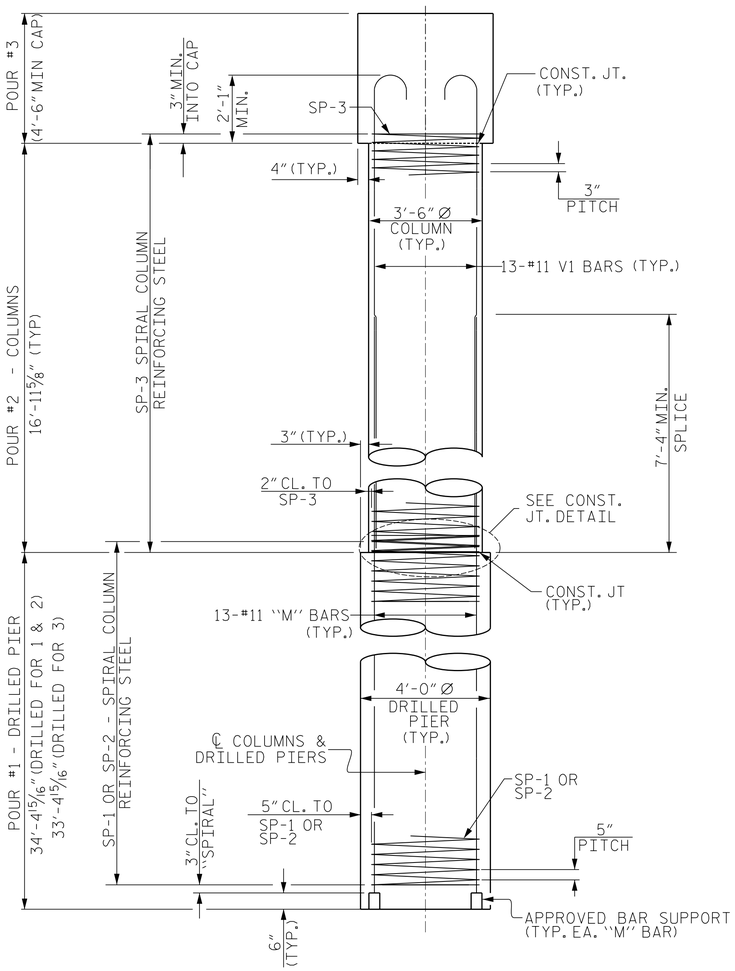
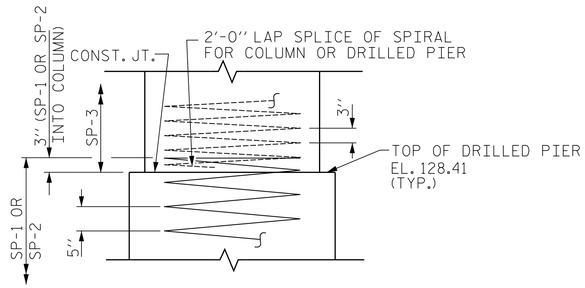


PLAN OF DRILLED PIERS & COLUMNS

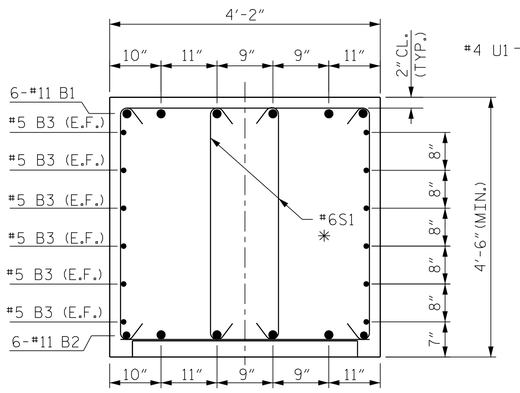
(REINFORCING STEEL IS TYPICAL FOR EACH COLUMN & DRILLED PIER)



END ELEVATION

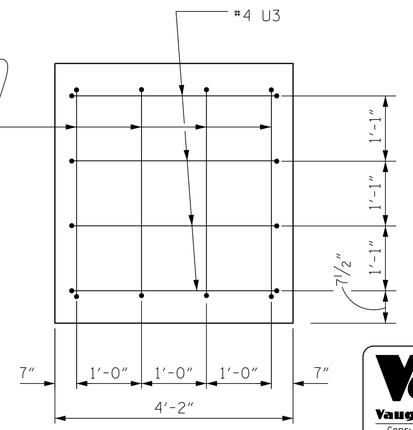


CONSTRUCTION JOINT DETAIL



✳ INVERT ALTERNATE STIRRUPS

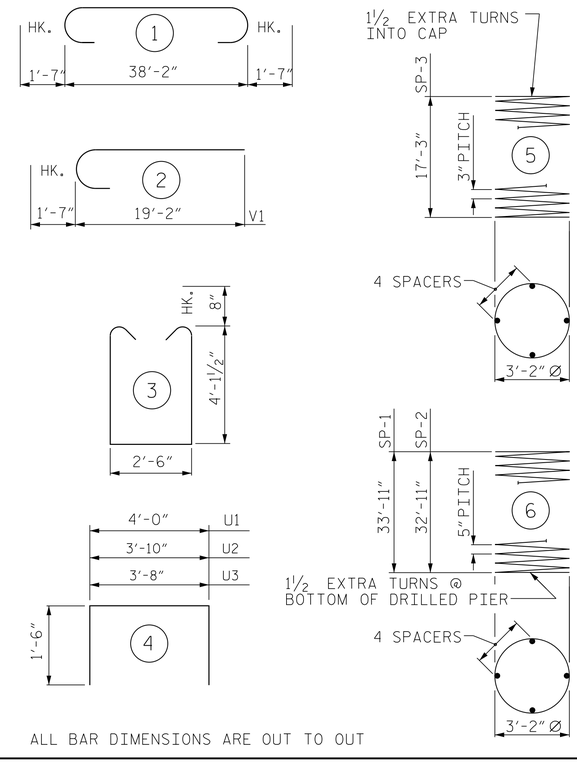
SECTION A-A



END OF CAP VIEW

(TYP. EA. END)

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT NO. 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	11	1	41'-4"	1,318
B2	6	11	STR	38'-2"	1,217
B3	12	5	STR	38'-2"	478
B4	6	4	STR	13'-8"	55
M1	26	11	STR	44'-3"	6,113
M2	13	11	STR	43'-3"	2,987
S1	104	6	3	12'-1"	1,888
U1	8	4	4	7'-0"	37
U2	25	4	4	6'-10"	114
U3	8	4	4	6'-8"	36
V1	39	11	2	20'-9"	4,300

REINFORCING STEEL (LBS.)	18,543

SP-1	2	✳✳	6	815'-7"	1,701
SP-2	1	✳✳	6	796'-0"	830
SP-3	3	✳	5	697'-4"	1,397

SPIRAL COLUMN REINFORCING STEEL (LBS.)	3,928

✳THE SP-3 SPIRAL REINFORCING STEEL SHALL BE W20 OR D-20 COLD DRAWN WIRE OR #4 PLAIN OR DEFORMED BAR.

✳✳THE SP-1 OR 2 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

CLASS A CONCRETE BREAKDOWN	
POUR #2 (COLUMNS)	20.9
POUR #3 (CAP)	27.3
TOTAL CLASS A CONCRETE (C.Y.)	47.6
DRILLED PIERS:	
DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS) (C.Y.)	47.6
4'-0" Ø DRILLED PIER NOT IN SOIL (L.F.)	16.0
4'-0" Ø DRILLED PIER IN SOIL (L.F.)	86.2
CSL TUBES (L.F.)	426.9

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
DN: cn=Patrick R. Gallagher, o=Vaughn & Melton, ou=ENGINEER, email=pgallagher@vaughnmelton.com, c=US
4/3/2020

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT 1 DETAILS

V & M PROJECT NO.: 31748-42

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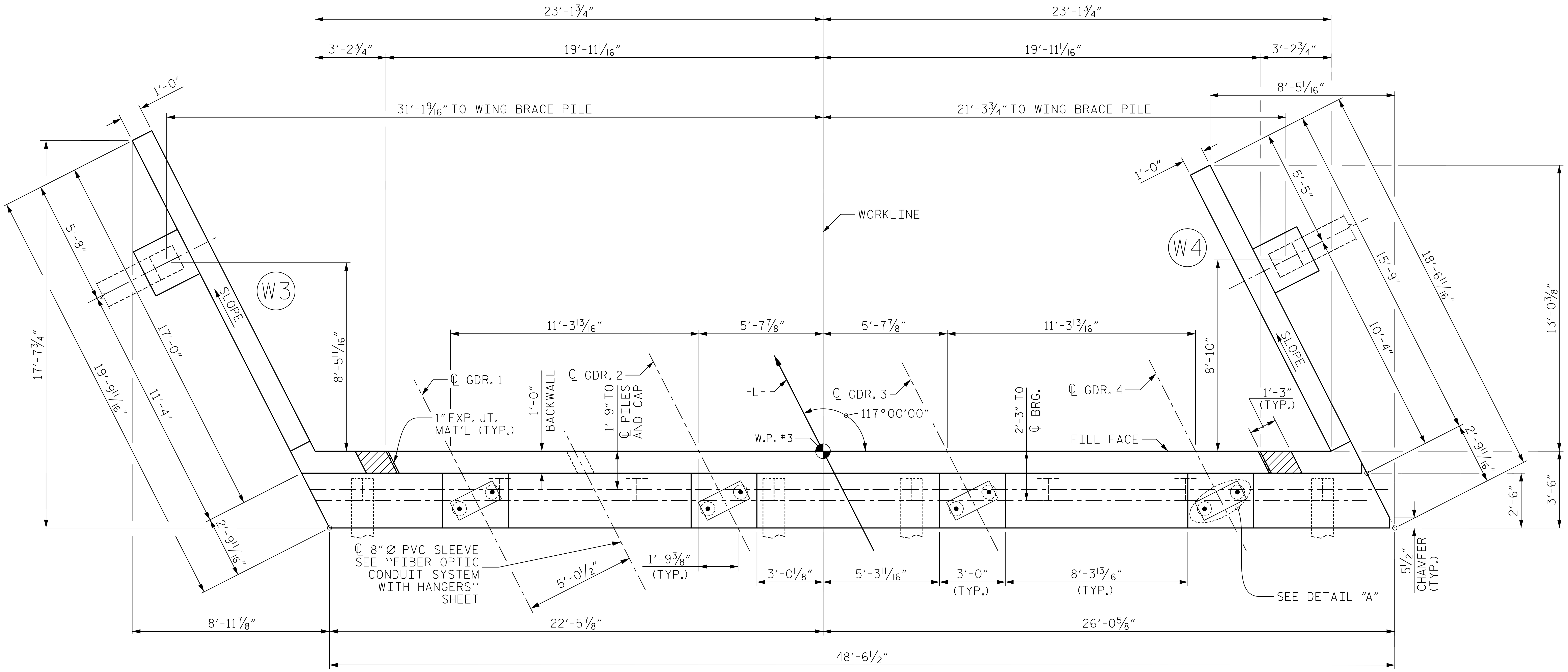
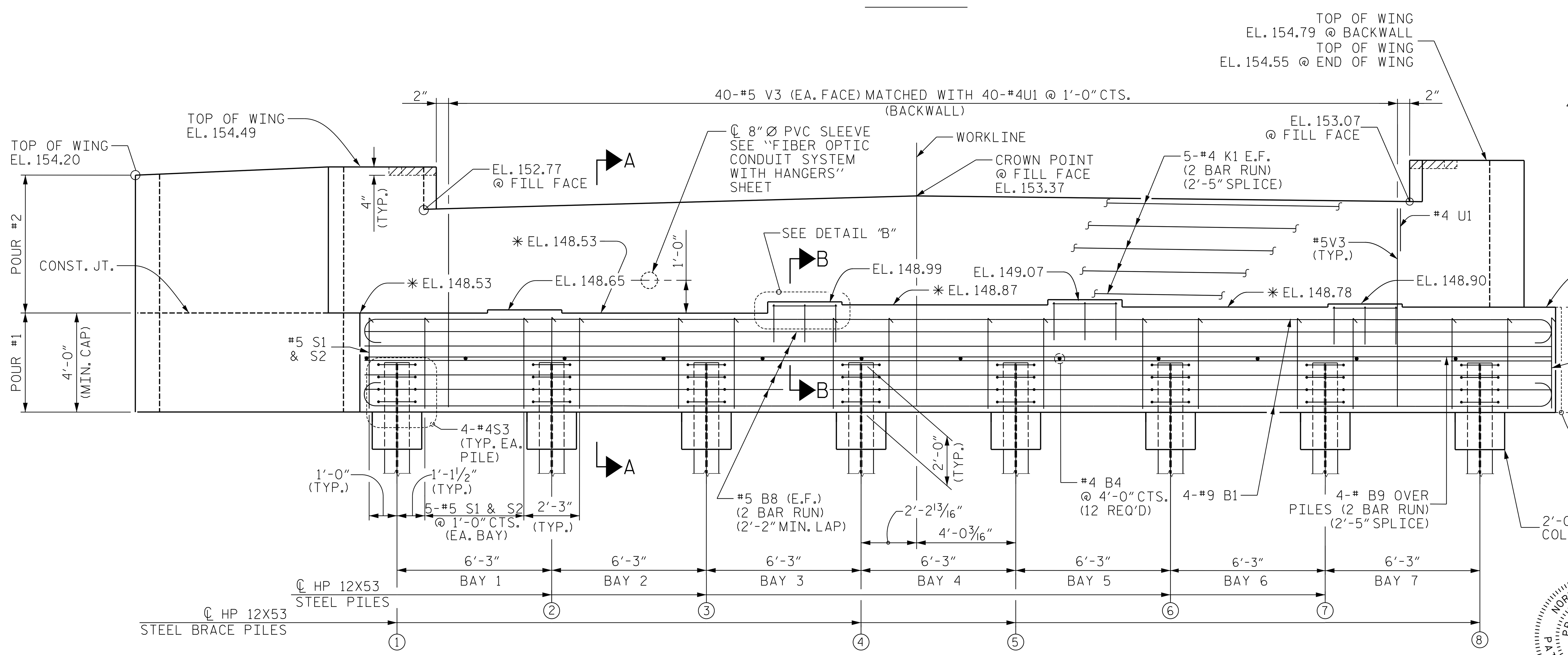
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-25
1			3			TOTAL SHEETS
2			4			31



PLAN



ELEVATION

WING BRACE PILES NOT SHOWN FOR CLARITY

NOTES

STIRRUPS IN CAPS MAY BE SHIFIED AS NECCESSARY TO CLEAR ANCHOR BOLTS.

FOR PIPE INSERT DETAILS, SEE BEARING SHEET.

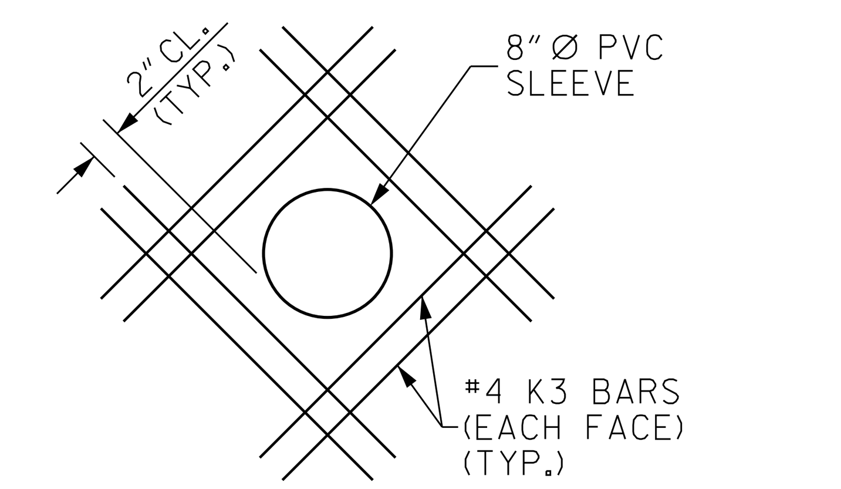
BACKWALL SHALL BE PLACED BEFORE APPLYING THE EPOXY PROTECTIVE COATING.

EPOXY COAT THE END BENT CAP AFTER ADJUSTMENTS ARE MADE TO BEARINGS AND ANCHOR BOLTS ARE GROUTED.

✱ THE TOP SURFACE OF THE CAP EXCEPT THE BRIDGE SEAT BUILDUPS SHALL BE SLOPED TRANSVERELY FROM THE FILL FACE TO THE BACK FACE AT THE RATE OF 2%

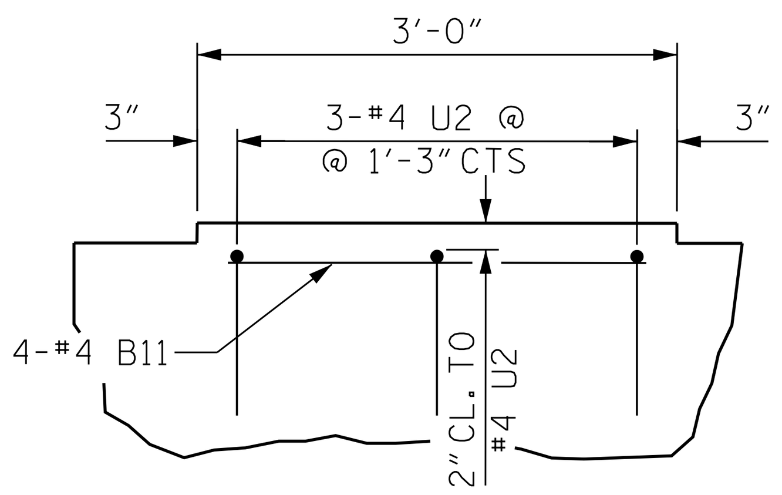
THE TOP SURFACE AREAS OF THE CAPS SHALL BE CURED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS EXCEPT THE MEMBRANE CURING METHOD SHALL NOT BE USED.

THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE JOINT BETWEEN THE DECK AND THE APPROACH SLAB HAS BEEN SAWED AND THE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.



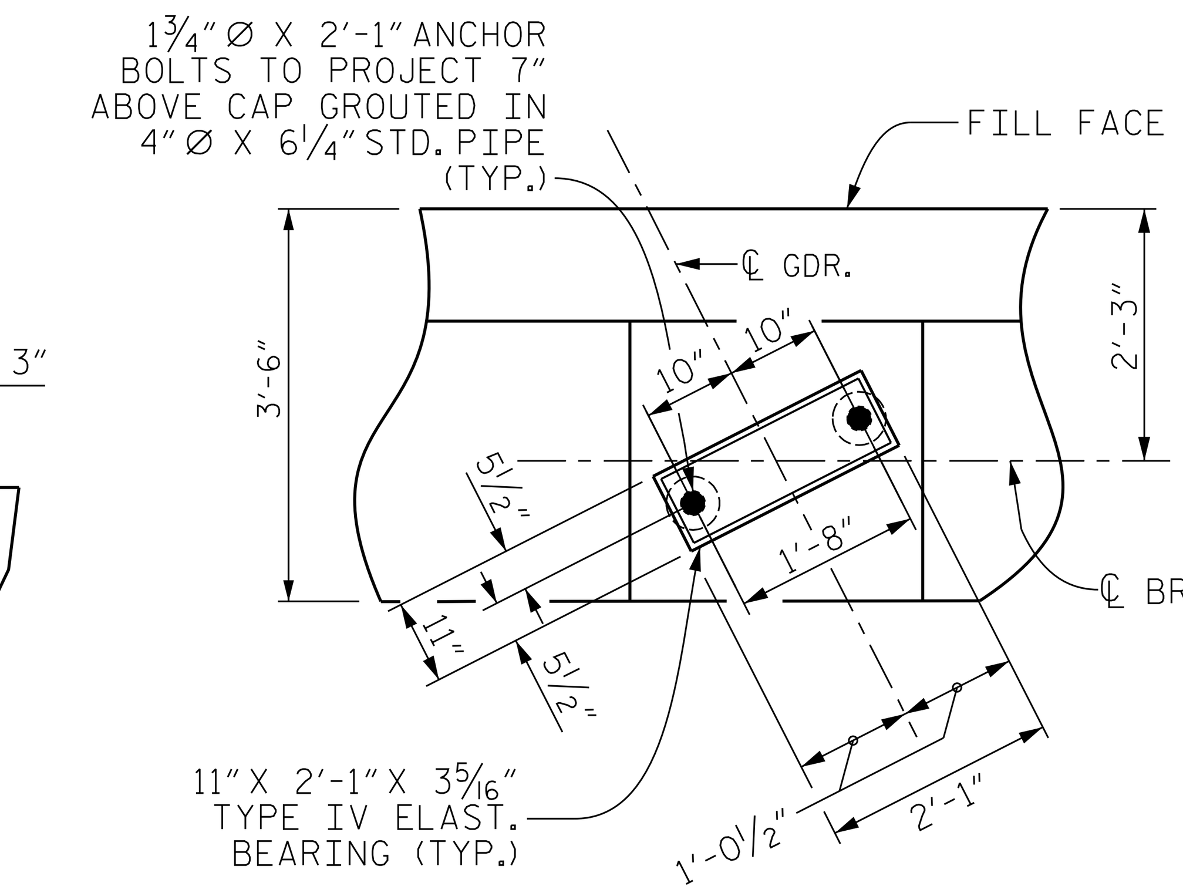
CONDUIT THRU BACKWALL DETAIL

THE 8" Ø PVC SLEEVE SHALL BE LOCATED BY THE ENGINEER



DETAIL "B"

(TYP. @ BRIDGE SEAT FOR GDR.S 2, 3, & 4)



DETAIL "A"

(DIMENSIONS ARE TYPICAL EACH GIRDER)

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- = 13+14.02 -SBL- / 29+02.29 -L- = 12+70.38 -NBL-

SHEET 1 OF 3

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 — PATRICK R. GALLAGHER — 4/3/2020

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

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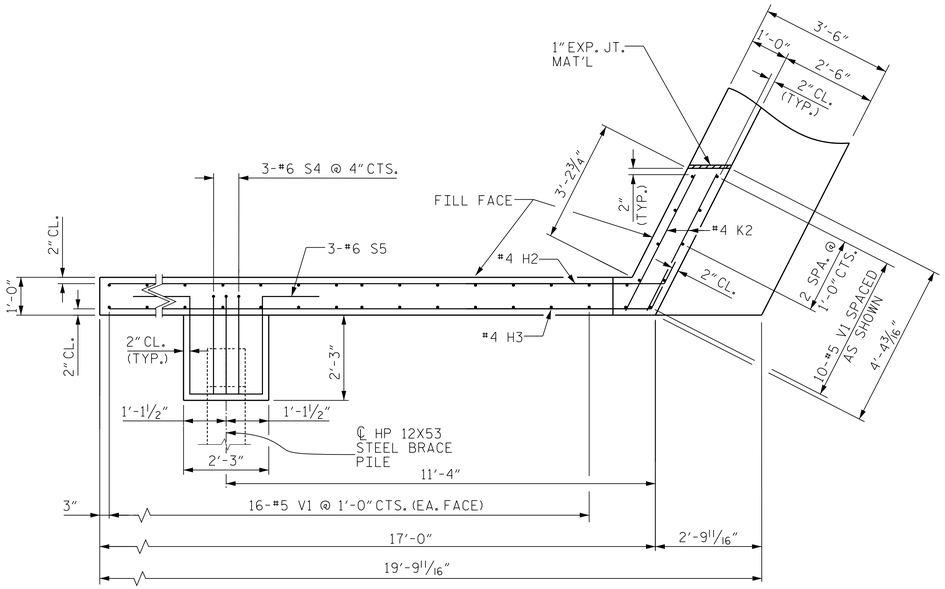
1			3		
2			4		

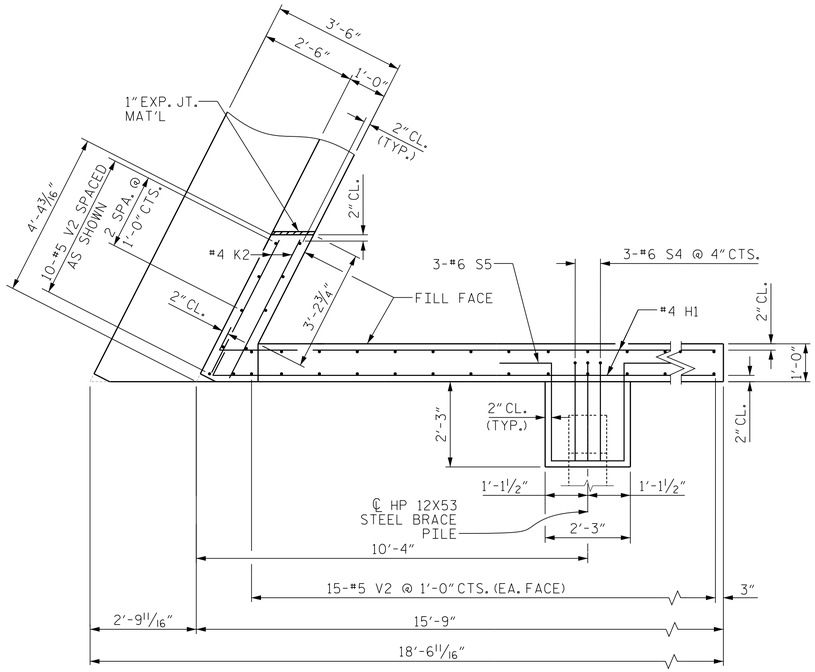
SHEET NO. S1-26

TOTAL SHEETS 31

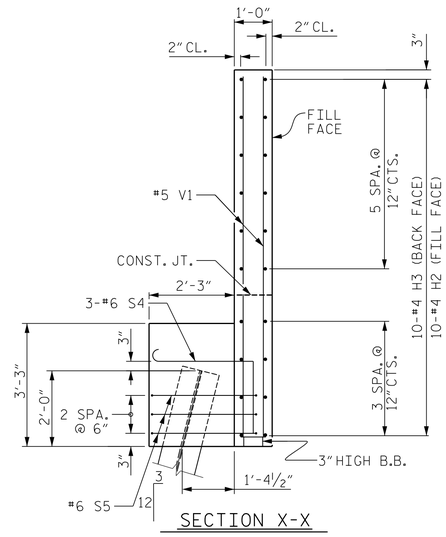
V & M PROJECT NO.: 31748-42



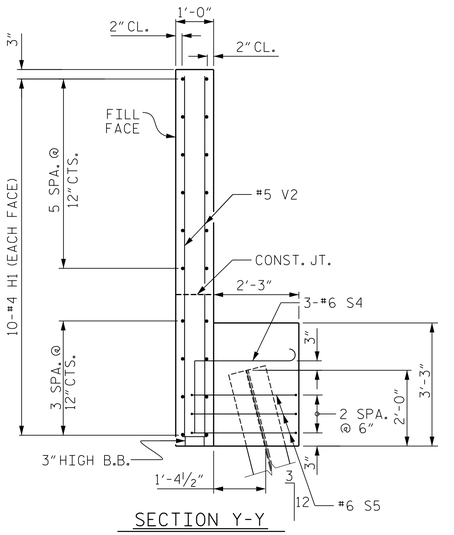
PLAN OF WING (W3)



PLAN OF WING (W4)



SECTION X-X



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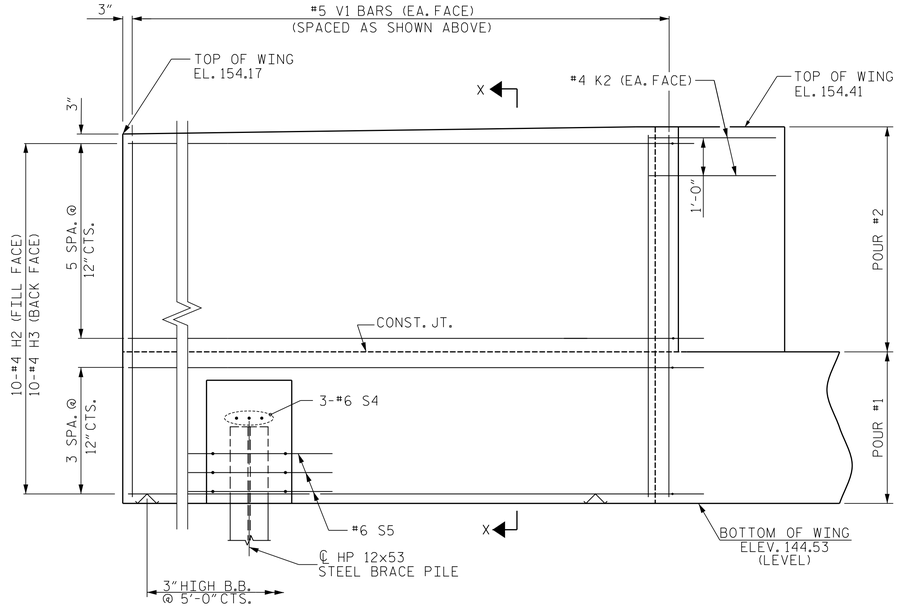
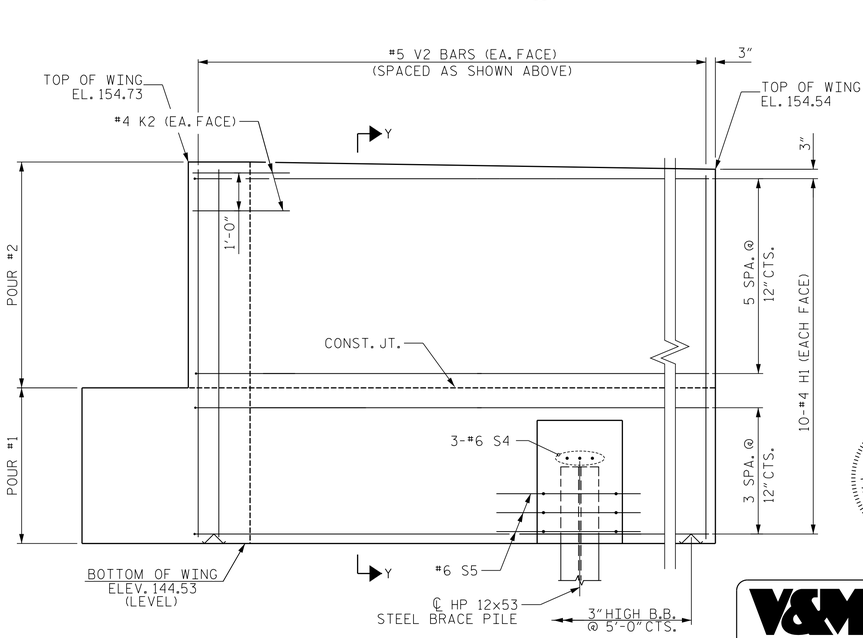


ELEVATION OF WING (W3)



ELEVATION OF WING (W4)

WING DETAILS

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK E. GALLAGHER
Docusigned by: Patrick E. Gallagher
4/3/2020

SHEET 2 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2

V&M Vaughn & Melton Consulting Engineers
Asheville, North Carolina 828-253-2796
Raleigh, NC 919-977-9455 · Charlotte, NC 704-357-0488
Boone, NC 828-355-9933 · Tri-Cities, TN 423-467-8401 · Knoxville, TN 865-546-5800 · Spartanburg, SC 864-574-4775 · Charleston, SC 843-974-5650 · Middlesboro, KY 606-248-6600 · Atlanta, GA 770-627-3590

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DWN. BY: AW DATE: 11/19
CHKD. BY: PRG DATE: 12/19

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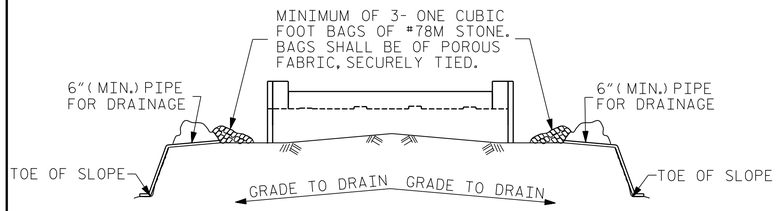
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-27
1			3			TOTAL SHEETS
2			4			31

V & M PROJECT NO.: 31748-42

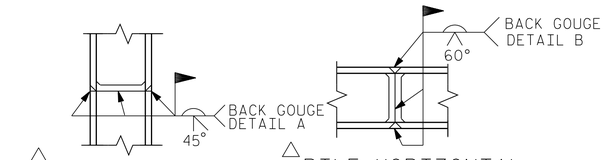


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

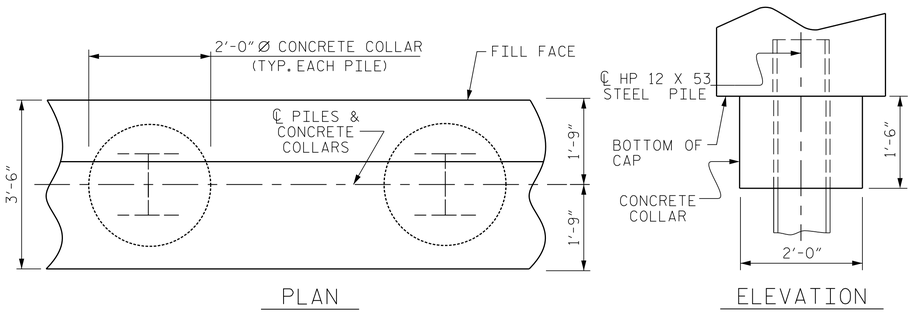
NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT



△ POSITION OF PILE DURING WELDING.

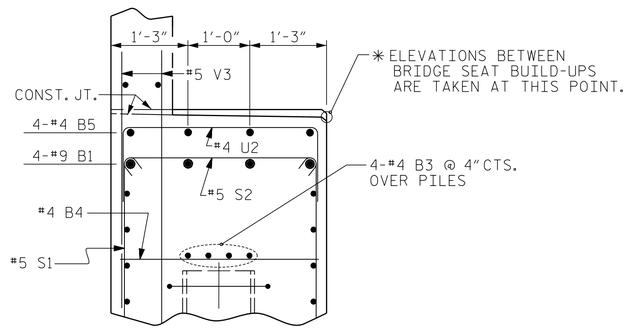
PILE SPLICE DETAILS



CORROSION PROTECTION FOR STEEL PILES DETAIL

SECTION A-A

(CONCRETE COLLAR NOT SHOWN)



PARTIAL SECTION B-B

BILL OF MATERIAL

END BENT 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	#9	1	50'-5"	1371
B2	10	#5	STR	48'-2"	502
B3	8	#4	STR	25'-4"	135
B4	12	#4	STR	3'-2"	25
B5	12	#4	STR	2'-8"	21
H1	20	#4	3	15'-7"	208
H2	10	#4	4	17'-8"	118
H3	10	#4	4	17'-4"	116
K1	20	#4	STR	25'-4"	338
K2	8	#4	STR	4'-0"	21
K3	16	#4	STR	2'-0"	21
S1	37	#5	5	11'-4"	437
S2	37	#5	2	4'-1"	158
S3	32	#4	7	6'-6"	139
S4	6	#6	8	5'-2"	47
S5	6	#6	9	10'-1"	91
U1	40	#4	6	3'-8"	98
U2	9	#4	6	6'-2"	37
V1	42	#5	STR	9'-3"	405
V2	40	#5	STR	9'-8"	403
V3	80	#5	STR	7'-10"	654

REINFORCING STEEL 5345 LBS.

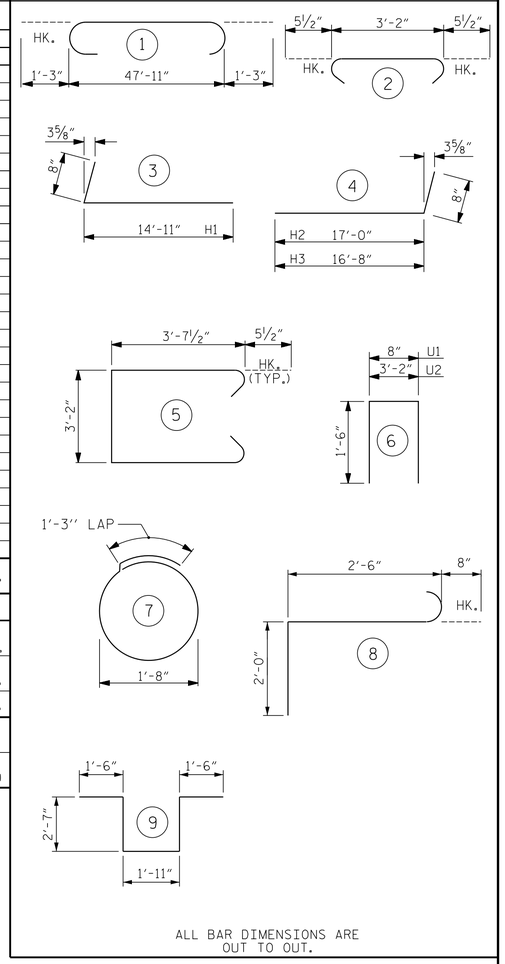
CLASS A CONCRETE BREAKDOWN

POUR 1: CAP, BOT OF WINGS, PILE COLLARS	33.8 C.Y.
POUR 2: BACKWALL, UPPER PART OF WINGS	14.8 C.Y.
TOTAL CLASS A CONCRETE	48.6 C.Y.

HP 12 X 53 STEEL PILES NO: 10 LIN. FT. = 370.0

PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 10

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L- =
13+14.02 -SBL-
29+02.29 -L- =
12+70.38 -NBL-

SHEET 3 OF 3

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

Digitally signed by Patrick R. Gallagher

V&M Vaughn & Melton Consulting Engineers
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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT 2 DETAILS

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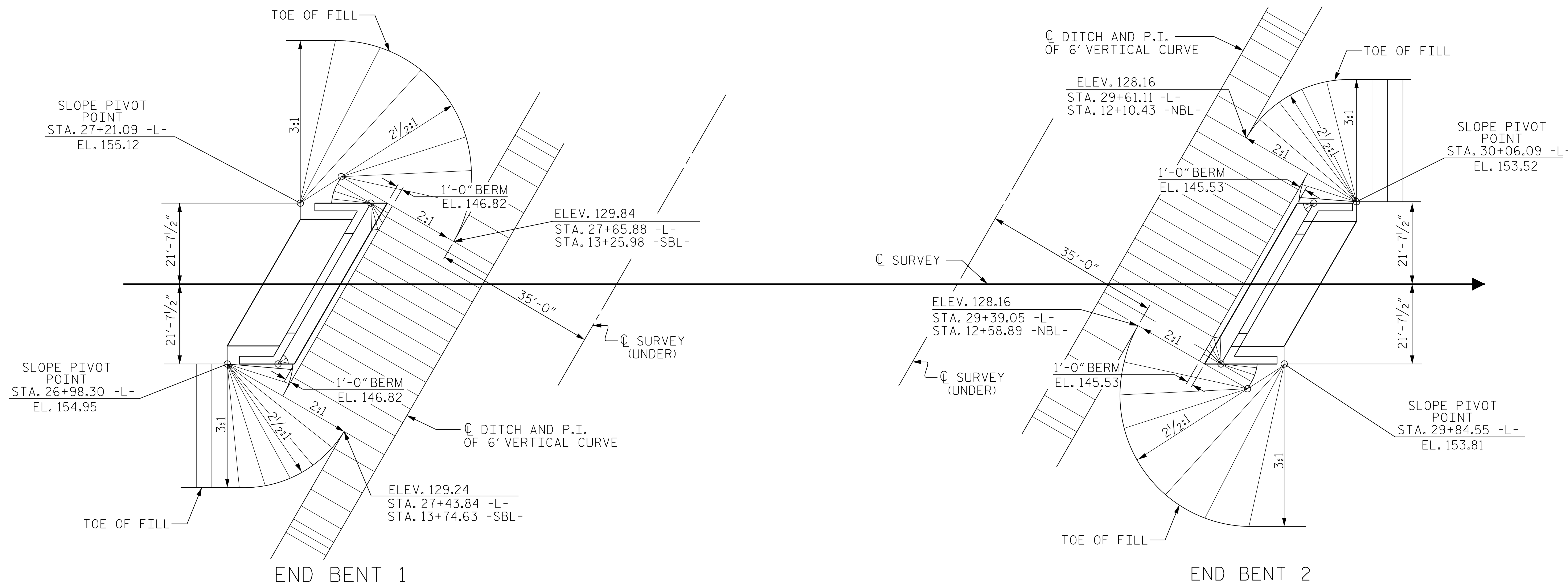
1			3		
2			4		

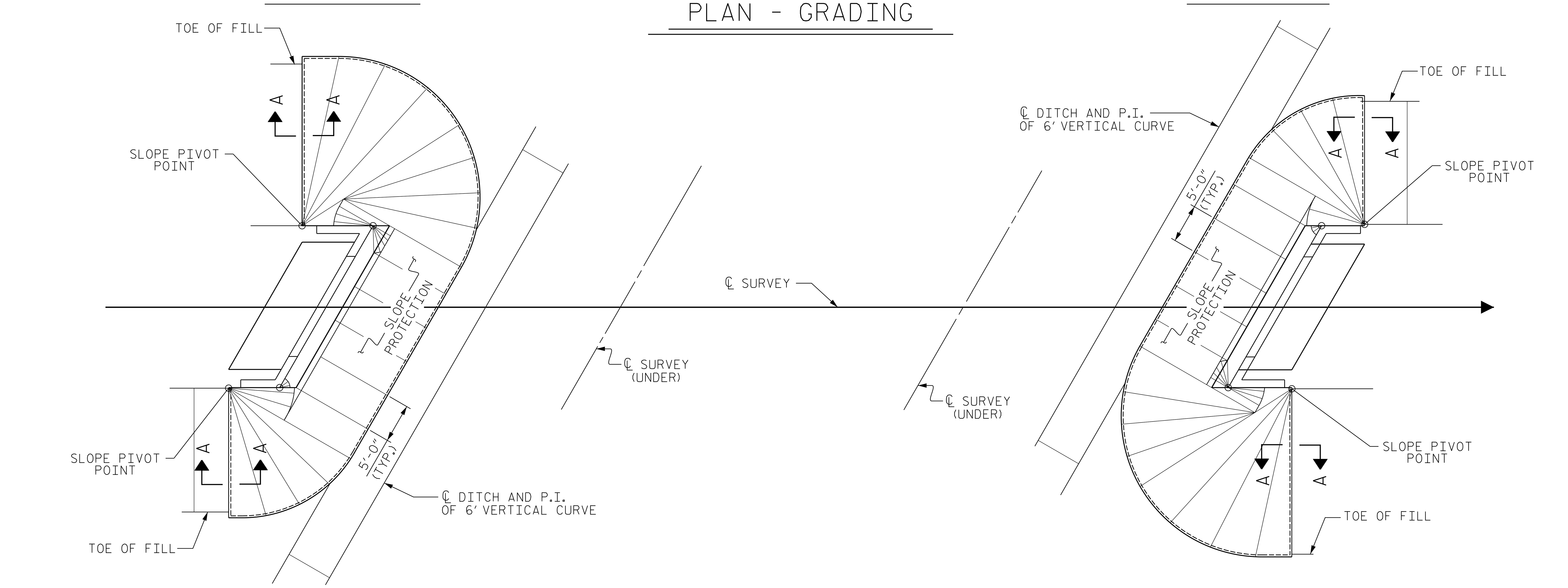
SHEET NO. S1-28

TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42



PLAN - GRADING

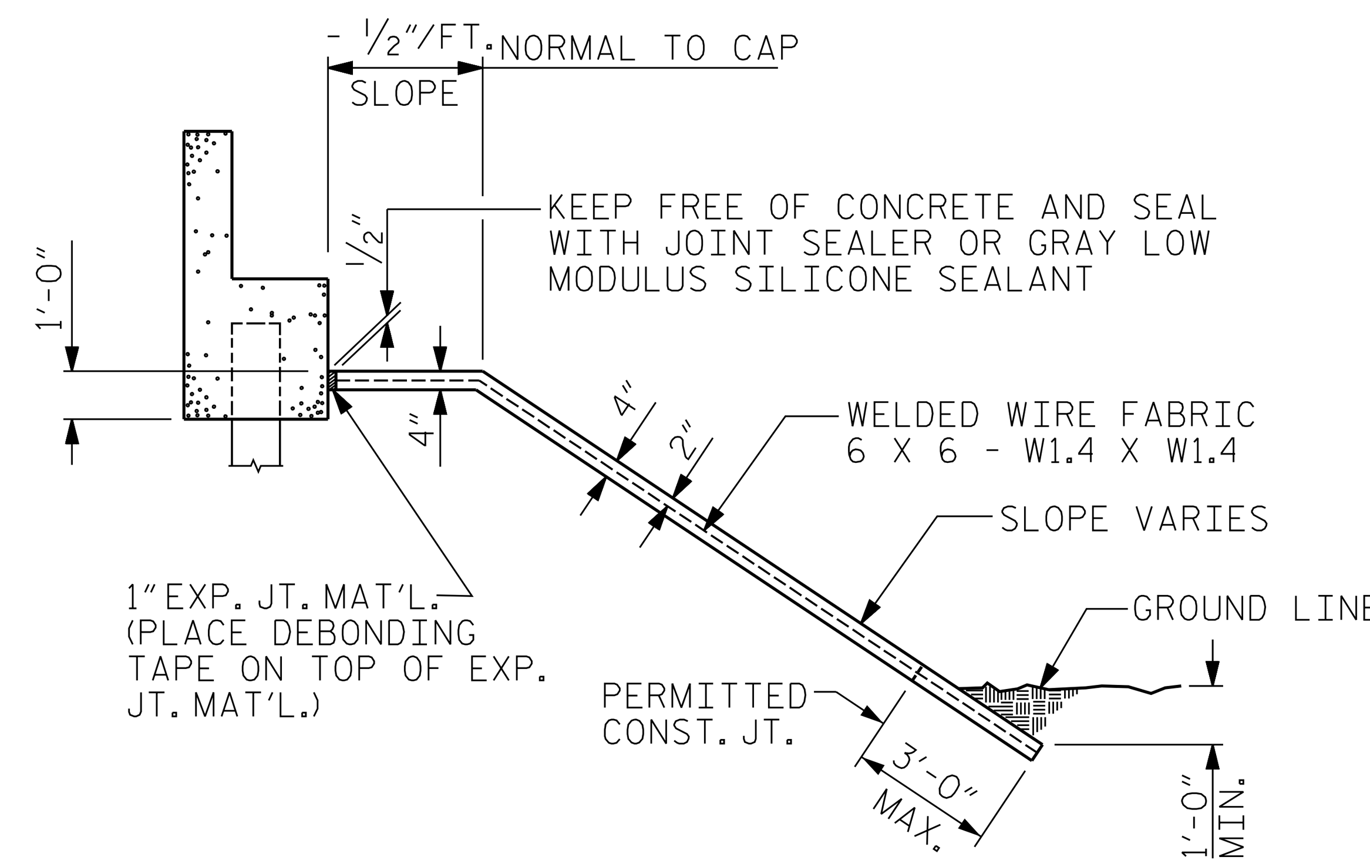


PLAN - CONCRETE PLACEMENT

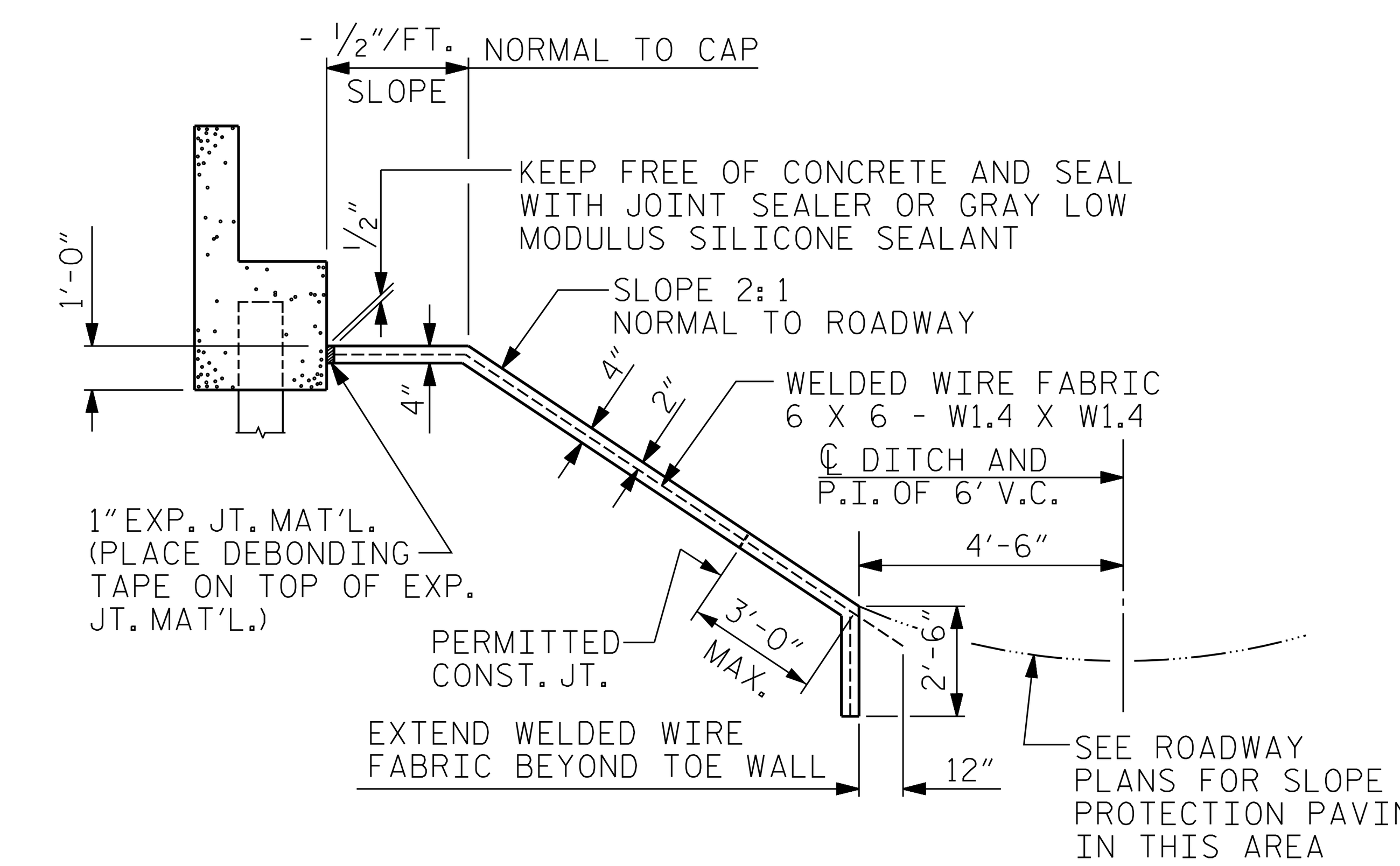
GENERAL NOTES

SLOPE PROTECTION SHALL BE PLACED UNDER THE ENDS OF THE BRIDGE AS SHOWN IN THE DETAILS. STRAIGHT EDGING WILL NOT BE REQUIRED UNLESS, IN THE OPINION OF THE ENGINEER, VISUAL INSPECTION INDICATES A NEED FOR IT. MEASUREMENT AND PAYMENT SHALL BE AS PRESCRIBED IN SECTION 462 OF THE STANDARD SPECIFICATIONS. FOR BERM WIDTH, SEE GENERAL DRAWING.

SLOPE PROTECTION SHALL CONSIST OF 4" POURED-IN-PLACE CONCRETE PAVING AS SHOWN IN THE DETAILS ON THIS SHEET. CONCRETE SHALL BE CLASS "B". THE CONCRETE SURFACE SHALL BE FLOATED WITH A WOODEN FLOAT AND FINISHED. WELDED WIRE FABRIC REINFORCING SHALL BE 6 X 6 - W1.4 X W1.4, 60" WIDE. SLOPE PROTECTION SHALL BE POURED IN 5' STRIPS AS SHOWN IN THE "POURING DETAIL" WITH 2'-0" LONG #4 BARS PLACED ALONG THE SLOPE BETWEEN STRIPS AT 1'-6" MAXIMUM SPACING. SLOPE PROTECTION MAY BE POURED IN ALTERNATE 4' AND 5' STRIPS AS SHOWN IN THE "OPTIONAL POURING DETAIL" WITH ADJACENT RUNS OF WELDED WIRE FABRIC LAPPING AT LEAST 6". THE COST OF THE WELDED WIRE FABRIC AND #4 BARS, IF USED, SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR SLOPE PROTECTION.



SECTION WHERE FILL CATCHES EXISTING GROUND



SECTION WHERE FILL CATCHES IN DITCH

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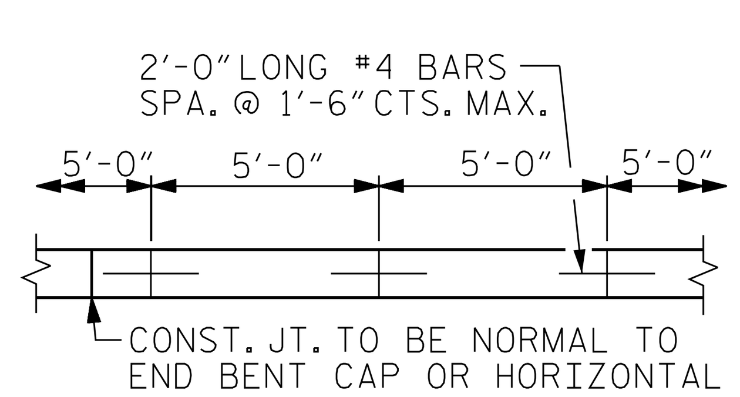
PROJECT NO. BR-0039

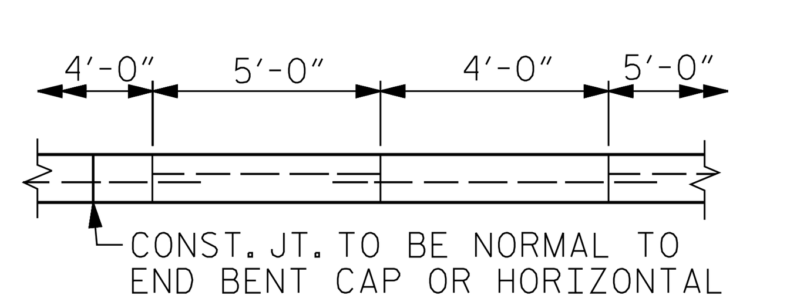
NASH COUNTY

STATION: 28+02.81 -L- = 13+14.02 -SBL-
29+02.29 -L- = 12+70.38 -NBL-



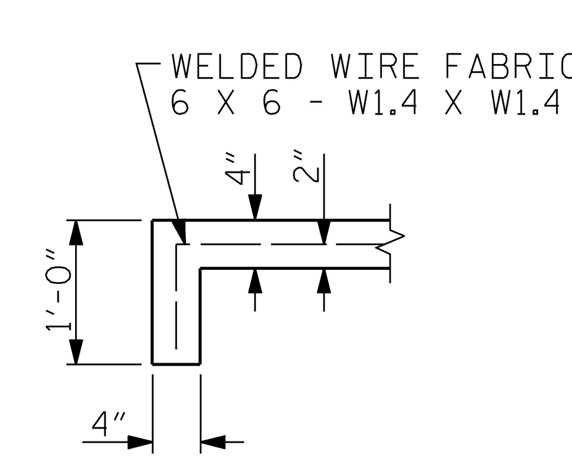
STRIP WIDTHS MAY VARY IN CURVED PORTION.

POURING DETAIL



POUR A 4'-0" STRIP FIRST. STRIP WIDTHS MAY VARY IN CURVED PORTION.

OPTIONAL POURING DETAIL



SECTION A-A

BRIDGE @ STA. 28+02.81 -L- STA. 29+02.29 -L-	4 INCH SLOPE PROTECTION	* WELDED WIRE FABRIC 60 INCHES WIDE
	SQUARE YARDS	APPROX. L.F.
END BENT 1	713	2202
END BENT 2	705	2104

* QUANTITY SHOWN IS BASED ON 5' POURS.

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 042890 PATRICK R. GALLAGHER 4/3/2020

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STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

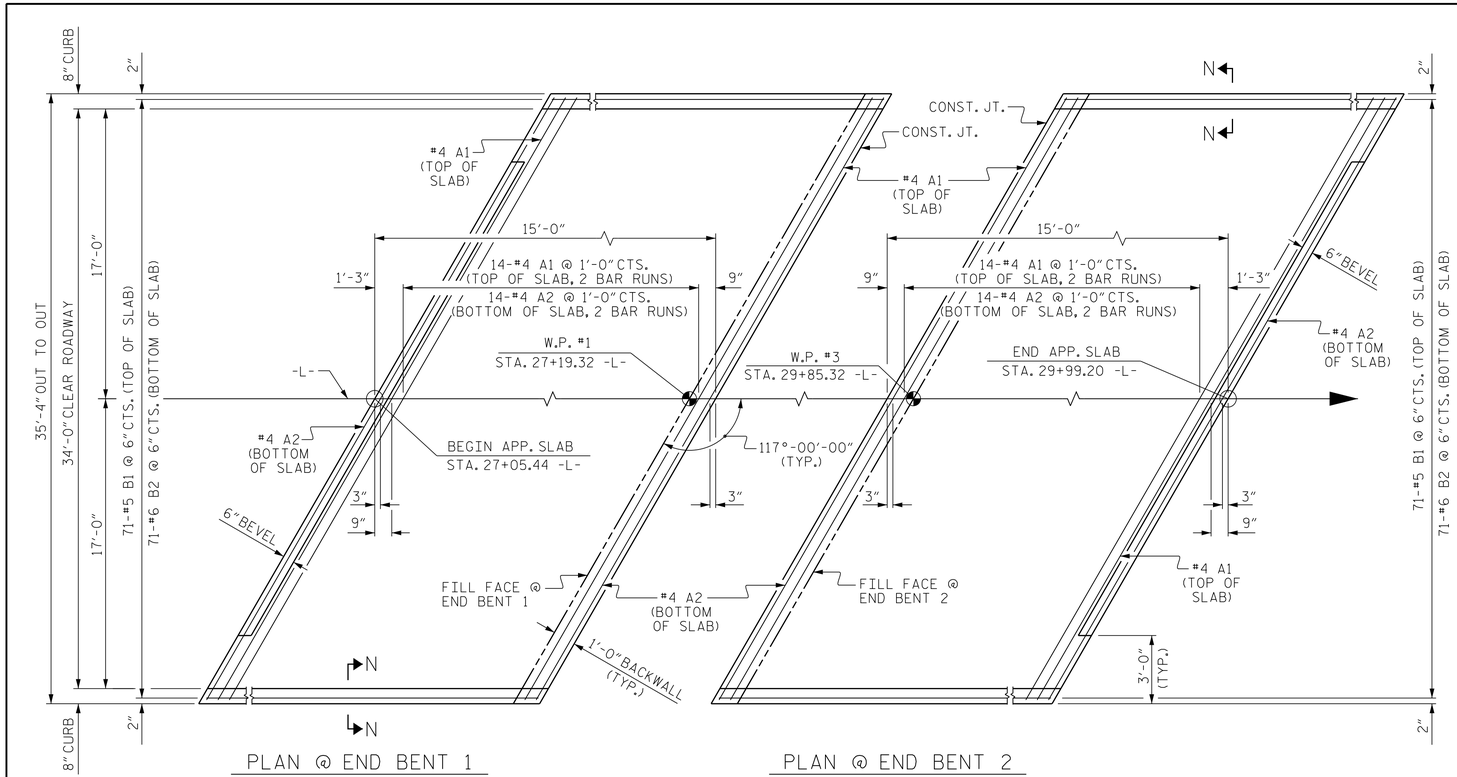
GENERAL DRAWING

SLOPE PROTECTION DETAILS

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

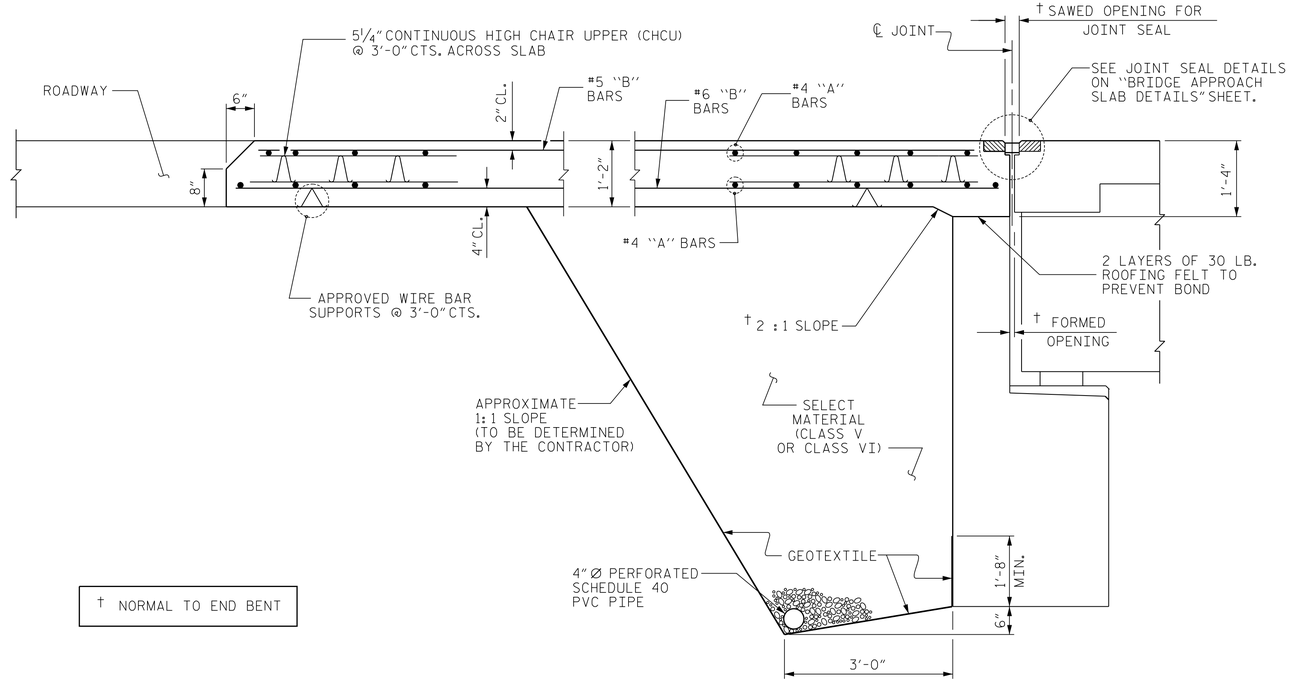
SHEET NO. S1-29
TOTAL SHEETS 31

V & M PROJECT NO.: 31748-42



PLAN @ END BENT 1 PLAN @ END BENT 2

DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS



† NORMAL TO END BENT

SECTION THRU SLAB

(TYPE II - MODIFIED APPROACH FILL)

NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.

GEOTEXTILE SHALL BE TYPE 1 IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.

SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.

SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.

APPROACH SLAB SHALL NOT BE CONSTRUCTED PRIOR TO COMPLETION OF THE BRIDGE DECK.

THE JOINT SHALL BE SAWED PRIOR TO THE CASTING OF THE BARRIER RAIL OR PARAPET AND END POST.

FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.

WITH FOAM JOINT SEAL

FOR FOAM JOINT SEALS, SEE SPECIAL PROVISIONS.

THE NOMINAL UNCOMPRESSED SEAL WIDTH OF THE FOAM JOINT SEAL SHALL BE 2".

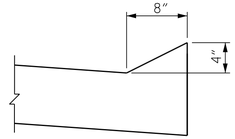
FOR ELASTOMERIC CONCRETE, SEE SPECIAL PROVISIONS.

BILL OF MATERIAL
APPROACH SLAB AT EB 1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	30	#4	STR	21'-9"	436
A2	32	#4	STR	21'-8"	463
✳ B1	71	#5	STR	13'-8"	1012
B2	71	#6	STR	14'-8"	1564
REINFORCING STEEL					2027 LBS.
✳ EPOXY COATED REINFORCING STEEL					1448 LBS.
CLASS AA CONCRETE					23.3 C.Y.

BILL OF MATERIAL
APPROACH SLAB AT EB 2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ A1	30	#4	STR	21'-9"	436
A2	32	#4	STR	21'-8"	463
✳ B1	71	#5	STR	13'-8"	1012
B2	71	#6	STR	14'-8"	1564
REINFORCING STEEL					2027 LBS.
✳ EPOXY COATED REINFORCING STEEL					1448 LBS.
CLASS AA CONCRETE					23.3 C.Y.



SECTION N-N

SPLICE LENGTHS

BAR SIZE	EPOXY COATED	UNCOATED
#4	2'-0"	1'-9"
#5	2'-6"	2'-2"
#6	3'-10"	2'-7"

PROJECT NO. BR-0039

NASH COUNTY

STATION: 28+02.81 -L-=
13+14.02 -SBL-
29+02.29 -L-=
12+70.38 -NBL-

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB FOR FLEXIBLE PAVEMENT

NORTH CAROLINA PROFESSIONAL SEAL 042890 ENGINEER PATRICK R. GALLAGHER
Digitally signed by Patrick R. Gallagher
4/3/2020

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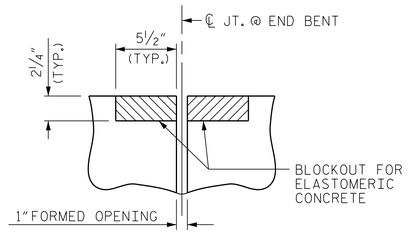
DRAWN BY : EEM	3/95	REV. 12/21/11 MAA/GM
CHECKED BY : VAP	3/95	REV. 6/13 MAA/GM
		REV. 12/17 MAA/THC

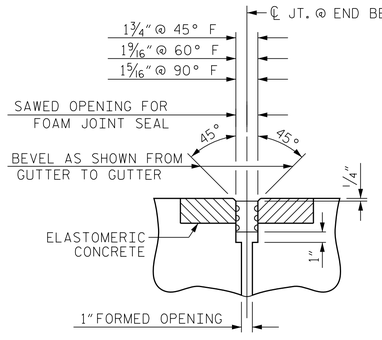
ASSEMBLED BY:	WDC	DATE: 6/2019
CHECKED BY :	PRG	DATE: 12/2019
DES. EGR. OF RECORD:	PRG	DATE: 12/2019

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	S1-30
1			3			TOTAL SHEETS
2			4			31

STD. NO. BAS2



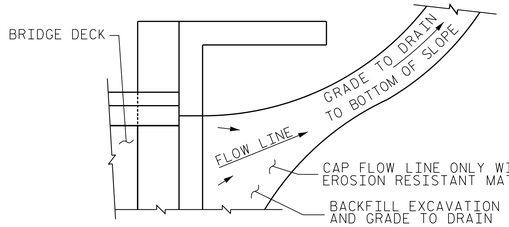
SECTION C-C
FOAM JOINT SEAL
(PRE-SAWED ELASTOMERIC
CONCRETE DIMENSIONS)



SECTION C-C
FOAM JOINT SEAL
(EXPANSION)

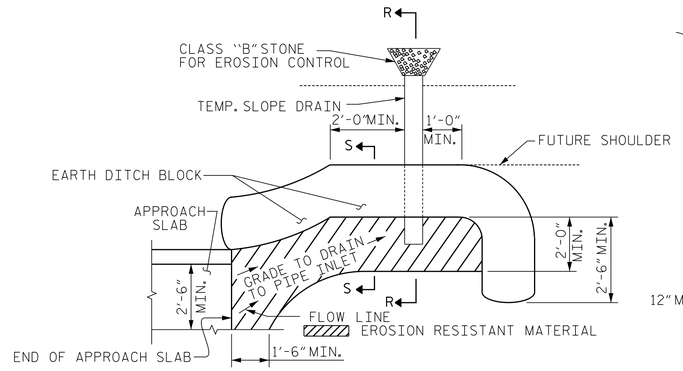
ELASTOMERIC CONCRETE	
END BENT NO.	ELASTOMERIC CONCRETE ✳ (CU. FT.)
1	6.6
2	6.6
TOTAL	13.2

✳ BASED ON THE MINIMUM BLOCKOUT SHOWN.



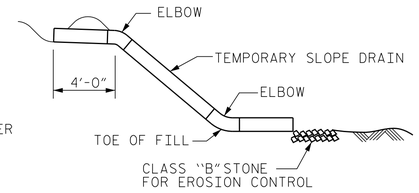
NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

TEMPORARY DRAINAGE DETAIL

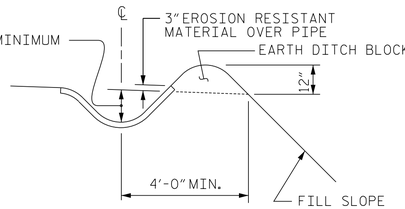


NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

PLAN VIEW



SECTION R-R



SECTION S-S

TEMPORARY BERM AND SLOPE DRAIN DETAILS

(TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

NORTH CAROLINA PROFESSIONAL SEAL 042890 ENGINEER PATRICK R. GALLAGHER
DocuSigned by: Patrick R. Gallagher
4/3/2020

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PROJECT NO. BR-0039

NASH COUNTY

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29+02.29 -L-=
12+70.38 -NBL-

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD

BRIDGE APPROACH SLAB DETAILS

DRAWN BY : FCJ 11/88	REV. 6/13 MAA/GM
CHECKED BY : ARB 11/88	REV. 12/17 MAA/THC
	REV. 5/18 MAA/THC

ASSEMBLED BY : WDC DATE : 5/2019
CHECKED BY : PRG DATE : 12/2019
DESIGN ENGINEER OF RECORD: PRG DATE : 12/2019

REVISIONS					
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		

SHEET NO. S1-31
TOTAL SHEETS 31

STD. NO. BAS4 (SHT 1b)

STANDARD NOTES

DESIGN DATA:

SPECIFICATIONS	A.A.S.H.T.O. (CURRENT)
LIVE LOAD	SEE PLANS
IMPACT ALLOWANCE	SEE A.A.S.H.T.O.
STRESS IN EXTREME FIBER OF STRUCTURAL STEEL - AASHTO M270 GRADE 36	20,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50W	27,000 LBS. PER SQ. IN.
- AASHTO M270 GRADE 50	27,000 LBS. PER SQ. IN.
REINFORCING STEEL IN TENSION - GRADE 60	24,000 LBS. PER SQ. IN.
CONCRETE IN COMPRESSION	1,200 LBS. PER SQ. IN.
CONCRETE IN SHEAR	SEE A.A.S.H.T.O.
STRUCTURAL TIMBER - TREATED OR UNTREATED EXTREME FIBER STRESS	1,800 LBS. PER SQ. IN.
COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER	375 LBS. PER SQ. IN.
EQUIVALENT FLUID PRESSURE OF EARTH	30 LBS. PER CU. FT. (MINIMUM)

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2018 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.

ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE ⅞" Ø SHEAR STUDS FOR THE ¾" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF ⅞" Ø STUDS ALONG THE BEAM AS SHOWN FOR ¾" Ø STUDS BASED ON THE RATIO OF 3 - ⅞" Ø STUDS FOR 4 - ¾" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

JANUARY, 1990

STD. NO. SN

REV. 6-16-95 EEM (✓) RGW
REV. 8-16-99 RWW (✓) LES
REV. 5-7-03 RWW (✓) JTE
REV. 5-1-06 TLA (✓) GM
REV. 10-1-11 MAA (✓) GM
REV. 12-17 MAA (✓) THC